RAILROAD GAZETTE

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CONTENTS

ILLUSTRATIONS:	PAGE.
The Micro-Structure of Bearing Metal	336
A Truck for a Passenger Motor Car	337
The Walker Electric Conduit	338
The Gold Improved Electric Heater	339
Grain Transfer and Weighing Car for the Chicago, Indianapolis and Louisville	340
CONTRIBUTIONS:	
When was a Locomotive called a Mogul?	335
Unambiguous Train Orders	335
Emergency Bridge Building	335
EDITORIAL:	
Railroad Earnings in a Silver Country	342
Two Air Brake Decisions	342
Mexican Foreign Trade	342
Annual Reports—Mexican Central	343
EDITORIAL NOTES	346, 347
NEW PUBLICATIONS	343
TRADE CATALOGUES	343
GENERAL NEWS:	
Locomotive Building	346
Car Building	346
Bridge Building	346
Meetings and Announcements	346
Personal	347
Elections and Appointments	347
Railroad Construction	348
Electric Railroad Construction	349
General Railroad News	349
Electric Railroad News	350
Traffic	350
MISCELLANEOUS:	
Technical	344
The Scrap Heap	344
The Congo Railroad	335
Punctuality of the Empire State Express	335
The Kinetic Motor	335
The Passaic Rolling Mill Explosion	336
Steel Tired versus Chilled Iron Wheels	338
Classifications of Pennsylvania Locomotives	339
Service Tests of the Diamond "S" Brakeshoe	339
The Massachusetts Investigation of Street Railroads	340
Street Railroads in Pennsylvania	
Navigation of the Volga	340
Compressed Air Motors on the Metropolitan Street Railroads	341
The Buluwayo Railway, South Africa	341
Foreign Railroad Notes	341-344

Contributions.

When was a Locomotive Called a "Mogul?"

To the Editor of the Railroad Gazette:

I find in Knight's Mechanical Dictionary the following:

Mogul: The name of a class of locomotive adapted for heavy freight traffic. It originated in the Baldwin Locomotive Works with the "E. A. Douglas," built in 1867. It is made in several sizes, but with the typical three pairs of connected drivers and a swinging pony truck in front.

Consolidation: A type of freight locomotive, the name of the engine, the first of its class built in 1866 at the Baldwin Locomotive Works, on the plans of Mr. Alexander Mitchell, to operate a grade of 1 in 40 on the Lehigh Valley Railroad and specially for the Mahony plane, which rises 133 ft. to the mile. It had cylinders 20x24 in., four pair of 48-in. diameter (pony) driving wheels, connected, and a two-wheel swing truck in front equalized with the front driving wheel.

If Mr. C H. Caruthers is correct as to the facts given in his communication published May 6 regarding "Early Baldwin Locomotives on the Pennsylvania Railroad," it would be of interest to revise Knight's definitions and fix the dates of the first designs of these types of locomotives and the origin of the name "Mogul." F.

Unambiguous Train Orders.

To the Editor of the Railroad Gazette:

I have read the note in your issue of April 22, first page, wherein you discuss the action of a train dispatcher who issued an order just before midnight and neglected to give the dates of the trains referred to in the order, one of the trains being non-existent until after midnight. I think you might well have characterized that dispatcher's carelessness or stupidity in more vigorous language. You censure him only by implication. It is really inexcusable for dispatchers to put conductors and enginemen to the trouble of asking to have orders elucidated. Many of the men running on freight trains are lame in their logic, and if you allow them to settle a question of interpretation once, they will take the liberty to do so in other and perhaps more critical cases. The fact is, our dispatchers need to be occasionally "jacked up" to the strict standard of the requirements of the rules, as well as the trainmen and telegraph operators. As long as everything runs smoothly, all the operators answering calls promptly and delivering messages in good shape, and all the trainmen carrying out the rules so well that no complaints come in, the dispatcher sits at his desk so constantly that he is liable to fall into the rut of mechanicalism. Ninety-five per cent. of the train and station men doing their work well by reason of their good discipline, and the other five per cent. making good records through good luck, the dispatcher comes to devote too much care to his own supposed interests, and thus gets into the unconscious habit of writing and transmitting orders in the way most convenient to himself, instead of in the way that is best for the recipients of the orders. This leads him to abbreviate, and, as abbreviation often saves time for the company, he is liable to think he is doing a good thing for the road.

The only safe rule is to carry out the regulations to their fullest extent at all times. Even if it be admitted that there are occasions when the delays inseparable from the duplicate order system are too burdensome to be borne, the suspension of the rules ought, if possible, to be ordered and supervised by the superintendent, or, at least, by some one other than the dispatcher. He, in the hurry of handling an extra rush of trains, is liable to sacrifice too much for the sake of saving a little time. Any dispatcher of conservative mind should be glad to have the benefit, at rush times, of some deciding authority outside of himself. A. C. M.

Emergency Bridge Building.

The Pittsburgh, Cincinnati, Chicago & St. Louis Railway Co.
Office of the Chief Engineer,
Pittsburgh, Pa., April 29, 1898.

To the Editor of The Railroad Gazette:

Apropos of the letters on "Torpedo Boats from the Lakes to the Ohio River," in your issues of April 15th and April 22, while not directly bearing on the question, the following may be of interest to your readers as an example of quick bridge building and rapid transportation:

This company had reason to build, in a limited time, a siding from its elevated roadbed in Chicago into an industry adjacent. The construction involved a turnout from main track, and 83 ft. skew through plate girder bridge 9 ft. high, with masonry abutments; 160 lin. ft. of timber trestle work, a 71 ft. square through plate girder bridge, 9 ft. high, on masonry abutments, from west abutment of which other trestle work was necessary to extend the siding into the industry in question.

The "rush" work comprised the two plate girder bridges and their abutments, and the 160 ft. of trestle work between them. The plate girder bridges had closed floor decks. The floor beams were of 12-in. beams, spaced about 22 in. apart center to center, upon which were laid ⅜-in. floor plates. The rails were laid directly upon the floor plates, between a double line of angle iron guards.

The instruction came to this office the afternoon of March 21 that the work described above must certainly be completed ready to pass trains by morning of the 11th of April. The order for the girder work was given by wire to the Edge Moor Bridge Works of Wilmington, Del., on the morning of Wednesday, the 23d of March, the agreement being that the work was to be completed and shipped within five days after the drawings were approved, and that the girders were to be made from material in stock. On Wednesday, the 23d of March, we sent a draughtsman to the bridge works to check over the work as it advanced. Drawings were begun on the morning of the 24th of March and were completed on the 28th of March. Meanwhile the manufacturing of the girders was proceeding. The girder work was completed on the 31st of March, and was shipped at 9 p. m. of that day. For each 71-ft. girder two cars were required, and for each 83-ft. girder three cars were required, in all ten cars for the four girders. The girders were 9 ft. in height, because such was the depth of web plates in stock. Allowing for blocking and height of flat cars, it was 14½ ft. from top of rail to top of girders on cars. For the gussets, floor plates and other material were required three cars. Total number of cars, thirteen, ten of which were "low flats," all equipped with air.

The train of thirteen cars, leaving Edge Moor Works at 9 p. m. on the 31st of March, arrived in Chicago at the bridge site at 5 p. m. on Saturday, the 2d of April, having come via the Pennsylvania Railroad to Pittsburgh, and via the Pittsburgh, Ft. Wayne & Chicago Railway from Pittsburgh to Chicago, the Pittsburgh Division of the P., C., C. & St. L. Ry. being in bad condition for rapid movement of trains, owing to the recent flood.

While the bridge work was being made the stone work and trestle work which had been placed under contract on the 23d of March were being pushed; also a contract was made by the bridge works already named with the Kelly-Atkinson Construction Co. to do the work of erection. The bridges were to be erected so as to pass trains within 100 hours after being received at bridge site, and to be fully completed within 220 hours from the time they arrived at the site.

The following is a schedule of progress of the work:

Contract awarded to Edge Moor Bridge Works, on Wednesday morning, March 23, 1898. Drawings completed at Bridge Works on Monday, March 28, 1898. Girder work shipped from Edge Moor Works at 9 p. m., Thursday, March 31, 1898. Girder work arrived at Bridge site, Chicago, 5 p. m., Saturday, April 2, 1898. Erection began Monday, April 4, 1898. Girder work ready for passage of trains on Thursday evening, April 7, 1898. Girder work fully completed and entirely riveted up, April 13, 1898. Time from placing order for bridges to time of completion in shop, nine days. Time of transporting bridges from Edge Moor to Chicago, 880 miles, 44 hours. Time from placing order for girder work with Edge Moor Bridge Works to time when bridges were ready for passage of trains, 16 days.

J. C. BLAND,
Prin. Asst. Engr., P. C. C. & St. L. Ry.

The Congo Railroad.

The Congo Railway from Matadi to Stanley Pool is stated to be so far advanced that the whole line will be opened for traffic by May 1, and the official inauguration has been fixed for July 1. When Mr. H. M. Stanley drew the horoscope of the Congo region on its discovery, he said that he attached little value to it without a railroad which would provide the means of transport across the districts of the Cataracts where the Congo is useless for navigation purposes. The railroad is now on the eve of completion from Matadi to Ndodo, on Stanley Pool, a little east of Leopoldville. The London Times gives the following details of the undertaking:

Before the railway, the conveyance of the existing commerce through the barrier region between the most eastern port on the Lower Congo and the resumption of navigation in Stanley Pool was effected on men's backs, the estimate being that considerably over 100,000 loads were thus conveyed during each season. After several surveys the length of the projected line was reduced from 435 to 390 kilometers, or about 260 English miles. Of this distance 360 kilometers are at the present moment actually constructed. The most difficult part of the line in respect of its construction was at Palaballa, a short distance out of Matadi, where a series of tunnels and cuttings through 17 or 18 miles of a rocky barrier had to be made with dynamite. With this exception the constructors of the railway have sought to avoid rather than to overcome natural obstacles, and the sinuosities of the line in its first section are remarkable. There are eight bridges, averaging 50 or 60 yards in length, but those across the Ngonga and Inkissi are twice that length. There are 10 intermediate stations, of which Lufu, Kimpesse, Inkissi and Ntamba are the most important. At the rate of speed sanctioned the journey will take 24 hours. The works have been five years in progress, and have been carried out by Belgian engineers, with Belgian machinery and capital.

The successful completion of the first railway in Central Africa has encouraged the Governor of the Congo State to look further ahead and to contemplate the second line urgently needed to develop its resources and realize its destiny. Several lines, indeed, are under consideration, but the decision has been come to that the line connecting the Lubefu with the Lomani and the Lualaba shall be the next taken in hand, and this will probably be before the close of the present year. The Lubefu is a tributary of the Sankuru, which flows into the Kassai, itself an affluent of the Congo. The Lomami, another affluent of the Congo, is an admirable river, navigable as far up in its course as Bena Kamba. A short line from the highest navigable point on the Lubefu, which may be considered something short of the point fixed by Delcommune, will therefore connect two of the most important arteries in the internal communications of Africa. But the important section of all will be the next link connecting the Lomami with the Upper Congo at or near Riba Riba, north of Nyangwe. An alternative but longer route, which would leave the Lomami at Bena Kamba, and reach by a curve to the southeast the Devil's Gates, the limit of navigation on the Lualaba or Upper Congo, is also under consideration. This latter line, when adopted, will no doubt form the main route to Lake Tanganyika. The main object of this cross railway from west to east is to connect with each other the highest navigable points on the Lubefu, the Lomami and the Lualaba, just as the first Congo railway, the completion of which will be shortly announced, was undertaken in order to bridge over, as it were, the unnavigable and useless part of the Lower Congo. It will thus be seen that a certain system has been devised in anticipation for the consecutive construction of desirable railways in the Congo State. The grand object of all is, however, to promote as rapidly as possible communications with those provinces of the state watered by the upper courses of the rivers named where there is reason to expect the greatest recompense for the efforts of civilization, and where certainly the climatic conditions are most favorable for Europeans.

Punctuality of the Empire State Express.

The Empire State Express of the New York Central & Hudson River Road has now been running over six years (since November, 1891), and has undoubtedly made by far the largest aggregate of "record runs" for a regular train that can be found anywhere. The permanent establishment of such fast schedules makes it of interest to examine the record more in detail than is usually done, and we have therefore procured from General Superintendent Van Etten a condensed summary of the train-sheet record of this train, both westbound and eastbound, for the calendar year 1897. The schedule speed westbound New York to Buffalo, 440.2 miles, including stops, is 53.35 miles an hour. Eastbound, Buffalo to New York, it is 48.9 miles an hour (50.6 Buffalo to Albany and 46.4 Albany to New York.) The train consists of four cars, weighing about 330,000 lbs., and is drawn by engines weighing about 60 tons, with cylinders 19x24 in., and driving wheels about 7 ft. in diameter. The monthly table is self-explanatory. It will be seen that the westbound train arrived at the end of its trip within 5 minutes of schedule time on 268 days out of 313, or 86 per cent., and the eastbound 308 times out of 313, or 98 per cent.

The causes of the delays to the westbound train were as follows:

Forty-one times (including one delay of 1 hour and 40 minutes, one of 1 hour and 20 minutes, and one of 1 hour and 5 minutes) were on account of strong head winds and snow storms; 6 times on account of hot boxes; 3 times on account of slight engine failures, necessitating delays for repairs or changing engines; 5 times on account of cold weather, engine not steaming and unable to make time; 2 times on account of

slowdowns for signals; 1 time (1 hour and 35 minutes) on account of freight wreck blocking tracks; 1 time on account of washout.

The eastbound train was delayed four times by slight engine failures and three times by hot boxes.

The schedule of the westbound train for the entire distance, New York to Buffalo, 444.20 miles, is at the rate of a very small fraction less than one mile a minute, exclusive of the regular stops. As speed is slackened 28 times between New York and Buffalo, it is necessary in order to keep on schedule time to run at a speed varying from 45 miles an hour at the slowdowns to 75 miles an hour at other places. In exceptional cases this rate is exceeded, and on 24 days in 1897, on account of the train arriving at the beginning of one division a few minutes late from the preceding division, or from some other cause which delayed the train on the division, it bettered its running time as follows:

RECORD OF EMPIRE STATE EXPRESS FOR THE YEAR 1897.

West Bound.	Trips.	Late.	On Time.	Late at Buffalo (minutes.) 5	10	15	20	25	30	35	40	45	55	65	80	95	100
Jan	26	10	16	1	1			..	1	..	1	3	1	..	1	..	1
Feb	24	11	13	6	2	1	2	..	..	..	..	..	..	..	..	..	..
March	27	7	20	1	1	2	2	1	..	..	..	..	..	..	..	..	..
April	26	3	23	..	..	1	1	1	..	..	..	..	..	..	..	..	..
May	26	0	26	..	..	..	..	..	..	..	..	..	..	..	..	..	..
June	26	1	25	..	1	..	..	..	..	..	..	..	..	..	..	..	..
July	27	2	25	1	..	..	..	1	..	..	..	..	..	..	..	..	..
Aug	26	1	25	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Sept	26	0	26	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Oct	26	2	24	1	..	1	..	..	..	..	..	..	..	..	..	..	..
Nov	26	7	19	..	2	1	1	..	..	1	..	..	1	..	..	1	..
Dec	27	15	12	3	3	3	..	2	..	3	..	..	..	1	..	..	..
Totals	313	59	254	14	10	9	6	5	1	4	1	3	2	1	1	1	1

East Bound.	Trips.	Late.	On Time.	Late at New York (minutes.) 5	10	20	25	45
Jan	26	1	25	1	..	..	..	..
Feb	24	1	23	1	..	..	..	..
March	27	4	23	..	2	..	1	1
April	26	0	26	..	..	..	..	..
May	26	0	26	..	..	..	..	..
June	26	0	26	..	..	..	..	..
July	27	1	26	..	..	1	..	..
Aug	26	0	26	..	..	..	..	..
Sept	27	0	26	..	..	..	..	..
Oct	26	0	26	..	..	..	..	..
Nov	26	0	26	..	..	..	..	..
Dec	27	0	27	..	..	..	..	..
Totals	313	7	306	2	2	1	1	1

Five times on the Hudson Division, from 5 to 15 minutes; 11 times on the Mohawk Division, from 5 to 15 minutes; 8 times on the Western Division, from 5 to 30 minutes. These notes refer only to runs when the train arrived at Buffalo on time.

The fastest time by divisions, including stops and slowdowns, was as follows:

Hudson Division .....142.88 miles in 145 minutes
Mohawk Division .....147.84 miles in 150 minutes
Western Division .....149.80 miles in 135 minutes

This last record, 149.8 miles in 135 minutes over the Western Division is equal to 66.6 miles an hour.

The Kinetic Motor.

Charles J. Bates.

In previously published articles on "Suburban Competition," my main point was to show that it is facility of handling traffic that gives the trolley companies their advantage. It is not in competition alone, however, that this facility is important, for there are many cases in which the amount of travel does not justify the expense of a central station; and it has no doubt been the failure to recognize this fact, that has led to the expenditure of so much money on trolley lines, that to-day cannot pay their running expenses. This has caused an inquiry for a motor that can be used where travel is light and where it is especially desirable that the car can be run independent of all outside connections, such as are necessary in all electric systems except the accumulator.

Among those offered we find the compressed air, gas and oil engines, the steam dummy (so called), and fireless locomotives. The last may include also the "kinetic motor;" a machine constructed generally on the principles of the fireless locomotive, but having a small firebox, with sufficient fire to compensate for the loss of heat by radiation, and to assist the generation of steam, to a degree that will avoid the necessity for reheating stations along the line. The idea of a fireless locomotive is based on the high capacity of water to contain large quantities of heat under high pressure, so that instead of carrying considerable weight of fuel, containing the elements of combustion for the production of heat, the heat itself may be said to be carried ready for use.

This system was first introduced by Dr. Lamm of New Orleans in 1872. After his death, a few years later, Leon Francq introduced it into France with numerous improvements. The latest form now in use in this country contains the improvements of Mr. A. P. Dodge under the name of the Kinetic Motor. His improvements consist mainly in the use of a small fire, as stated above, and which requires no additional fuel or attention during the trip, and in details of mechanical design, the most important of which is the condenser, placed on the roof of the car.

The best form of the kinetic motor is that of a car on eight wheels mounted on two truck frames, each with a king bolt. Each truck is a small locomotive in itself, without a boiler, having two cylinders, with the wheels coupled on each side. The storage reservoirs, containing the superheated water, are hung to the car body between the trucks. From the steam chamber the steam pipe is carried to a reducing valve, so that steam at a uniform pressure can be given to the cylinders. This reducing valve is so connected to the operating levers that the motorman can operate the car from either end, as in the case of a trolley or cable car; the same remark applies to the reversing and air brake fixtures. The exhaust from the cylinders is carried to the top of the car, then through a series of pipes, forming an air condenser, by which it is reduced to water again, thus avoiding any noise from exhaust blast, and, by condensation, removing any back pressure from the pistons. With the consumption of a small amount of fuel and condensation of the exhaust, preventing any blast, no evidence of combustion should be visible. This, of course, depends largely on the success of the air condenser, a method of condensing with which not much experience has been had. The heat absorbing power of air is small as compared to water, so the success of an air condenser, acting on exhaust steam, will depend largely on the amount of surface that can be secured and the facility for using the steam and exhausting it at as low a pressure as possible; this, of course, would make compounding desirable if practicable.

It is not worth while here to enter into any mathematical investigation of the development of steam from superheated water; suffice it to say that M. Godfernaux* shows that with water at about 200 lbs. per square inch pressure, about one eighth of the water can be drawn off as steam at about 50 lbs. pressure.

In the operation of the system in France, using no fire on the motor, it has been necessary to carry a considerable bulk of water on the motor and to have reheating stations at frequent intervals along the line. In France no condensers were used. The design of the kinetic motor contemplates using a relatively small fire, which is heated to incandescence before being run in under the water reservoirs, the grates and ash pans are mounted on rollers, so that they can be drawn out and the fire receive full attention without creating dust near the car body, in which passengers are carried. The latest design of motor carries enough fire to evaporate, in conjunction with the heat stored in the water, about a half of the water carried. This is to enable the use of motors over considerable distances without frequent recharging stations. Such charging stations as are necessary are provided with stationary boilers constructed to stand a working pressure of 225 lbs. per square inch, and of such capacity as will keep the motors running, supplied with hot water; this will depend, of course, on the number of cars run, and the distances between stations will be regulated by the length of the line, and those considerations that determine the locations of water stations on any railroad.

The condenser is made of interior and exterior tubes, the exhaust steam entering the space between them, and the air passing through the interior tubes and around the outside, securing the largest surface for condensation.

The successful development of such a motor is a matter of considerable interest to railroad as well as street car men, as a means of providing them with a system, by which they can transport passengers with equal economy at long or short intervals; and by an apparatus that will not disturb existing conditions, and of a design with which they are already quite familiar, as the motor does not differ, mechanically speaking, much from the locomotive.

*"La Traction Mecanique des Tramways" reviewed in the Railroad Gazette, April 15, p. 280.

The Passaic Rolling Mill Explosion.

We noted briefly last week a few facts in connection with the boiler explosion at the Passaic Rolling Mills in Paterson which occurred early Wednesday morning of last week. These mills are situated about a quarter of a mile south of the Erie Station at Paterson, and the boiler house, which stands beside the tracks of the Erie, contained 14 horizontal tubular boilers, each 60 in. diameter by 16 ft. in length, and capable of developing in all about 2,000 H. P. An examination a few hours after the explosion made it evident that not more than two of the boilers exploded, although nearly all the others were damaged and some entirely destroyed. At the time of the explosion seven of the boilers had been cleaned and four others were being attended to by the son of the regular fireman, who occasionally took his father's place, and was regarded by the night engineer in charge as a very competent man. According to the statement of Mr. Charles Rose, who had charge of the electric lighting station of the plant, there was but 50 lbs. pressure in the boiler room a few minutes before the explosion occurred. This, however, does not prove anything in regard to the pressure in the boilers at the time of the explosion, and the only one who could give evidence on that point was the man in charge, who was killed by the accident.

An examination of the different parts, which were thrown in all directions, leads one to believe that the boilers which exploded were of the best material, much better, in fact, than some of the others which are still in position, some of which were not under fire at the time. The theory has been advanced that the gas accumulating from the pea coal, which was used as a fuel, was the direct cause; but the manner in which many of the pieces were torn from the boiler proper, and other particulars observed and gathered a few hours after the explosion, rather bar this theory from reasonable consideration. The crown piece, weighing about 500 or 600 lbs., was thrown some 500 ft., and 12 of the rivets which were used in the dome were completely sheared off. Other pieces were sent a considerable distance, and some of the machinery in the vicinity was damaged.

But little delay resulted from the accident, inasmuch as part of the battery could be easily repaired, and there were other boilers in Paterson ready to be placed in position, and already many repairs have been made. It was very fortunate that the gas generators, 12 in number, which were located directly to the south of the boiler house, were not damaged. Had these exploded the loss would be much greater than it is. Further investigation may reveal some facts which may lead to a true explanation of the cause of the explosion, but probably as much is now known as ever will be.

The Micro-Structure of Bearing Metal.

Only a comparatively few years past railroad men would have laughed at the idea of attaining the train weights and speed of to-day. They would have advanced a hundred difficulties, and chief among these would have been the difficulty of obtaining a bearing metal which would meet the requirements. Many accidents are on record which can be traced to a "hot box" having delayed a train; and apart from the safety and successful movement of trains which can be accomplished only by the use of well fitted, well lubricated journals, composed of a proper anti-friction alloy, the question of cost is also an important factor, not only first cost, but also the expense which is directly dependent upon the wearing qualities of the alloy and its successful use as scrap. A metal to be successfully used as scrap must have the quality of not deteriorating in remelting. The importance of these considerations is at once obvious to a well-regulated railroad which considers the great loss occasioned by wear and the necessity of converting their scrap again into a first class journal brass.

Copper and tin alloy in former years was the standard bearing metal, but it has now almost universally been replaced by the copper, tin and lead alloy and phosphor bronze. These two alloys are to-day considered the standards and are in use by all the leading railroads of our country. These alloys are superior, as has been demonstrated by practical comparative tests, to any combination of copper and tin. Dr. Dudley, chemist of the Pennsylvania Railroad, in his lecture some years ago, before the Franklin Institute, gave the results of a long series of experiments with bearing metals. These results showed that the copper, tin and lead alloy, either with or without phosphorus, gave far greater service than the copper and tin alloy, and had greater anti-frictional qualities. I take the liberty of quoting his conclusions:

First, "The copper and tin alloy is much more liable to heat under the same state of lubrication than the phosphor bronze bearing metal."

Second, "The rate of wear with the copper and tin alloy is nearly 50 per cent. greater than the standard phosphor bronze."

He further states that he has no evidence to show that phosphorus has any valuable influence on the wearing quality, except in producing sound castings.

If phosphorus has no other advantage in the copper, tin and lead alloy than to produce sound castings, why should it be used in a bearing metal when sound castings of this alloy can be obtained without it, with more uniform and lasting results by means of careful and proper manipulation? I say more lasting results, because such an alloy does not change or become crystalline as does the phosphor bronze after repeated meltings. In a previous article I took up the question of the deterioration in the anti-frictional quality of phosphor bronze due to remelting. That such deterioration does result is a well known fact and is explained by the crystallization of the phosphides of tin and copper within the alloy.

With these thoughts and facts in mind, I was led to make a study of the copper, tin and lead alloy, to find if such an alloy could be produced which would be sound and at the same time homogeneous in every part.

Such alloys are manufactured on a large scale by foundrymen under the name of anti-friction metal and are sold under various well sounding names, which are supposed to indicate their qualities.

To one who is unacquainted with, or does not consider the chemical and physical properties of lead,

it appears a very easy matter to make such an alloy by merely melting in a crucible the three metals in the stipulated proportions, but when we consider the greater density, the lower melting point and the slight affinity of lead for the copper and tin alloy, a more serious question results. I have found by my repeated microscopic examinations of many alloys of different makers that lead is in no instance combined or really alloyed with the copper and tin, or, perhaps only in small proportions, probably not over one per cent. The remaining lead being held diffused through the alloy in its uncombined state, or with small proportions of the tin and copper, but not enough to destroy the grayish blue color.

Such an alloy under the microscope is seen to be made up of two principal colors, the bronze colored combined copper and tin, and the grayish blue lead. Now, this being the case, it will be seen how difficult it is, and also important, to obtain an alloy which will show the same structure and percentage of lead in all its parts. The difficulty in obtaining such an alloy is this—as I have stated above:

First, The lead is not alloyed with the copper and tin.

Second, Owing to the high specific gravity and the lower melting point of the lead, its tendency is to go to that part of the casting which has last solidified, or to distribute itself unevenly throughout the mass.

Of all metals, lead is by far the first in anti-frictional qualities, and if to the strength of copper and tin there is added a suitable proportion of lead thoroughly and evenly distributed throughout the mass, the bearings as they wear are constantly in contact with soft anti-frictional particles of lead, which are backed by the harder particles of combined copper and tin. If in such an alloy the lead is not homogeneously distributed, both the wearing and anti-frictional qualities are greatly affected.

The accompanying photographs demonstrate the structure of copper, tin and lead alloy of several makers—they all have about the same composition and were all cast in the same size bars, great care being taken to have the conditions as nearly alike as possible. A section was then cut out of the middle of each bar for examination.

Fig. 1 shows the micro-structure of an alloy. The whole analysis gave:

Copper	76.40
Lead	11.75
Tin	11.60

It shows the lead evenly distributed throughout the metal in very small particles.

Fig. 2 shows an alloy having the lead fairly well distributed, but in larger particles. This metal did not cast sound, as is shown by the very dark spots on the picture, which are holes, the light spots showing the lead.

The analysis of this metal was:

Copper	76.88
Tin	10.62
Lead	11.71

Figs. 3 and 4 show that lead very unevenly distributed, it having separated in large pools here and there throughout the metal.

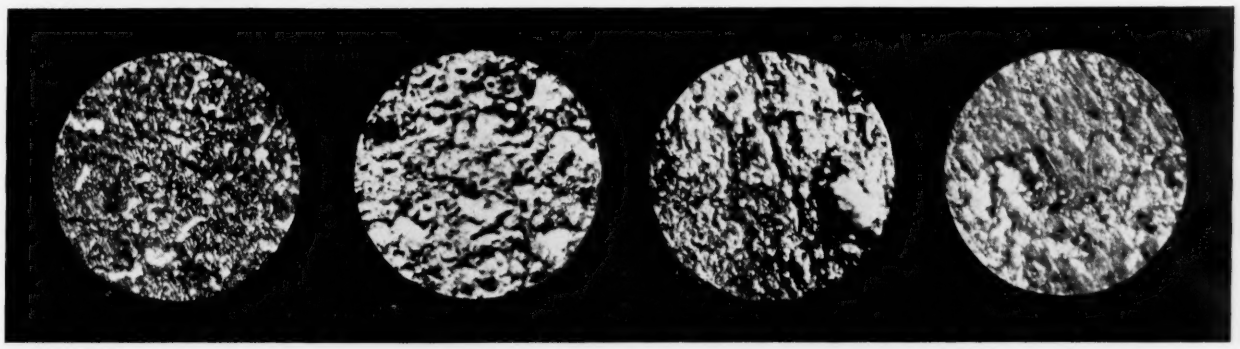


Fig. 1. Fig. 2. Fig. 3. Fig. 4.

Microscopic Tests of Bearing Metals.

Analysis respectively were:

	No. 3.	No. 4.
Copper	76.66	75,95
Tin	11.68	10.65
Lead	10.83	12.96

MICRO.

A Truck for a Passenger Motor Car.

An audacious experiment in electrical railroad work is being tried in France. The idea is an electric passenger locomotive which shall not only haul a train, but shall carry passengers as well. This is not a novel plan in electric railroad work, but it is to be carried out upon a scale and in a manner which has never been attempted in this country. The French proposition is to build a moderate sized, double-truck passenger coach, weighing complete 90,000 pounds and provide it with sufficient motive power to utilize the adhesion obtained by this weight. This locomotive is to haul the train and carry passengers. The line is some 200 miles long and express speed is to be maintained.

The car body was built in France. The under frame is of channel bars. It is 36 ft. 9 in. long and 6 ft. 9 in. wide. The channels are apparently about 10 in. deep. No details are given of the body, which is carried by a pair of "Perfect trucks" (The J. G. Brill Co.'s No. 27) of the type especially designed for steam passenger cars. These trucks are as great a departure as the scheme for the car itself. One of them is shown in the illustration.

Under the conditions, these trucks have two distinct functions, first, that of driving trucks; second, that of a railroad carriage. The car and the machinery must be carried with the least disturbance, curves must be passed smoothly and the load must not have a destructive action upon the roadbed.

To meet the requirements of the locomotive the trucks are very substantial. The side frames, which also form the jaws for the journal boxes, are forgings nearly as large as a locomotive frame. They are deeper, but not as thick. These frames are handsome pieces of blacksmith's work. The engraving was made direct from the untouched photograph of the truck just as it came from the shop.

The end pieces of the frame are T-irons carried by palms worked on the side pieces. The seats in these palms are finished and the holes are reamed for taper bolts. Locomotive practice is followed in these trucks and wherever bolts are used they are made taper and the holes are reamed. The swing bolster is held between a pair of angle iron transoms bolted to the side frames. The ends of the angle are cut out and bent so as to form brackets for the purpose. The wheels are 45 in. in diameter, of cast iron, and are mounted upon large axles. These are 7 ft. 6 in. long, and 3 in. diameter at the wheel fir. The journals are 4¼ by 3 in.

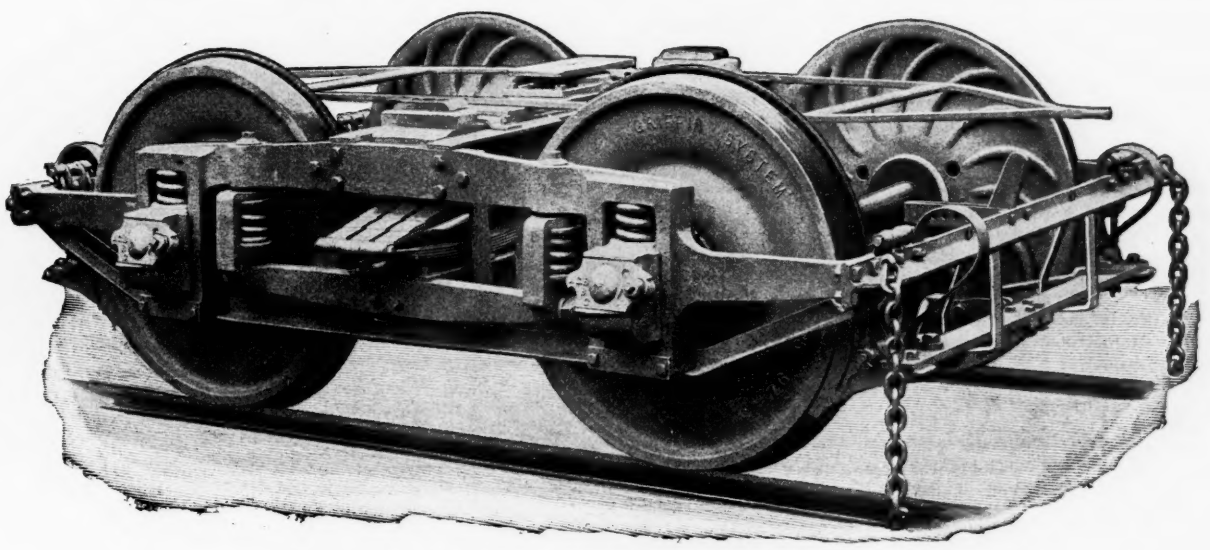
Each truck is furnished with a pair of 150 H. P. motors, thus giving the car 600 H. P., as much as an ordinary locomotive, and from a practical point more, since its method of application is more advantageous. The trucks weigh 11,030 pounds each, the motors 10,000 per pair and the car body 34,000. This brings the weight, without passengers up to a little more than 66,000 pounds. Lead or iron ballast will be used to get the required load of 90,000 pounds.

So far as the constructive features are concerned, locomotive practice has been followed; strength to carry the load, stiffness to resist strains and weight to secure adhesion, have been provided. But beyond that a new departure has been made in the locomotive truck for the French car. Ease of riding was considered of the utmost importance, and it was determined to make it ride as smoothly as a carriage, and for this the initial step was the introduction of journal springs over the boxes. The first advantage of this is the reduction of the weight not carried by springs which now consists of wheels, axles and boxes only. The equalizer, instead of resting directly on the boxes, is carried by open links, in which another set of springs are introduced. The latter have the same capacity as those on the journal boxes, and have a double function, cushioning the equalizing movement where the wheel rises, and cushioning the swing motion when the truck moves sidewise. This prevents the jerk felt when the ordinary truck enters a curve even at a slow speed.

The equalizing bar forms a part of the swing motion, and is attached at its center to the spring plank. The links by which it is carried are attached to the wheel piece a short distance from the centers of the journal boxes. The hanging of these links is peculiar. It consists of a large bar carrying a spring seat upon the lower end, while the upper post terminates in a square head, under which a ball or hemisphere is finished, forming with a hemispherical cup in the solid frame a ball and socket joint. The hole beneath is made sufficiently large to allow the bar to have the required swing. This construction gives an extra long link, as no room is taken up by the hinge.

Upon the spring plank there are two sets of triple elliptics. Quadruple springs would have been preferable, but in this case the contract limited the wheel base to 6 ft., and there was only room for the triple springs. The construction gives a vertical elasticity at least one-third greater than that obtained with the M. C. B. standard 4-wheel truck with the same load carrying power.

The steadiness of these trucks under the action of the brakes is a valuable feature which railroad men will appreciate. On account of the changed relation-



Brill "Perfect" Truck for a French Motor Car.

ships between the bearing points, and the suspension of the equalizers at the ends with the weight actually central, these trucks do not tilt under the action of the brakes. The brake rigging is, of course, much less sensitive to wear than in the common truck. This feature, also, under some circumstances, reduces the liability to skidding.

As shown in the engraving, this truck is substantially the form of "Perfect" truck which the Brill Company recommend for passenger service on steam roads. It is fitted with the M. C. B. standard box, and in other respects would conform to the standard. The brake rigging is nearly the same as that used on heavy steam car work. The brake beam in this case is a heavy flat bar trussed for strength, but the brake hangers, springs, straps, etc., are like those used on steam road trucks. It should be noted that the double brake rod shown in the cut is a feature introduced for the purpose of clearing the motors, which come up very high. The brake levers could not be inclined because the French guard rails are high and fill the whole space between the rails, except a small opening in the center, which was the only place for the lower rod. By using pipe the double rod was made quite light.

The Walker Electric Conduit.

The accompanying figures show the new design of the Walker conduit, a cross section of which is shown in Fig. 1. The yoke, A, is designed so as to require the least amount of iron possible without impairing the strength of the yoke. These yokes are placed every 5 ft. and imbedded in concrete; they are of uniform size and weight, and have a broad base designed to give a very solid roadbed. The hand holds, B, give access to the insulators and are attached to the remaining portion of the yoke and slot rail, as shown in the figure. This design affords an easy method of renewal in case the tops are worn or break. The projecting sides are firmly imbedded in concrete. The conduit is of standard size, being 16 in. wide by 24 in. deep, with sewer connections every 100 ft. The conductor bars, CC, are of T iron 3x2½ ins., weighing 18 lbs. per yard, about 250,000 circular mills cross section and made in lengths of 30 ft. each. The insulators, DD, are placed every 15 ft., and designed so as not to crack or break from expansion and contraction. They are attached to the slot rails, the stem passing through the conductor bar at a point near its center of gravity, thus preventing all strain due to the weight of the conductor.

In Fig. 2 the plow, EE, is shown in longitudinal cross section. The contact plates are carried on coiled springs, which allow a free movement in all directions. A fuse is provided between the contact spring and the conductor wires leading through the leg of the plow, as shown in the cut. A somewhat distinct feature in the design of this plow is in the arrangement of the two wheels, FF, which are attached to the leg of the plow, and bear against the inner edge of the slot rail, GG, thus forming a guide and preventing any undue pressure against the conductor bars.

The conductor wires are carried through an insulating top, H, at the top of the plow, where they terminate in contact plates. A cap, J, with spring contact points is provided, which is suspended on flexible wires beneath the car. This cap being placed on top of the plow makes the electrical connection with the controller. The device placed on the truck for carrying the plow is so made that by removing the cap and lifting a latch the plow may be quickly detached from the car.

Steel Tired Versus Chilled Iron Wheels.

The writer, having had many years experience in the manufacture and sale of both chilled cast iron and steel tired wheels, and the opportunity of examining the wheels of both types returned "worn out" or "failed" from many different railroads, begs leave to offer the following "facts, figures and observations" resulting from this experience in reply to Mr. Sanderson's paper on chilled cast iron wheels, published in the Railroad Gazette of April 29.

First, as to the assurance with which he relies upon good specifications and careful tests to secure a supply of the best quality of cast wheels. Every one who is familiar with the nature of cast iron and the methods of making it into car wheels must know that the examination and test which is made of wheels cannot possibly determine the perfection of any other wheel except those actually tested, and therefore the acceptance or rejection of a certain lot or number upon the result of the tests applied to one or a few of the number becomes a deception and a snare. Because one or more wheels of a lot will withstand the prescribed blows or thermal tests cannot possibly assure more than a hope that all the remainder of the lot may prove secure in service. Certainty of this can only be reached by running the risk of ruining every wheel made by tests, which, of course, is a commercial impossibility. Scientific study of mixtures, care in melting, pouring and chilling, have made great improvement in cast iron wheels, but they never have, and, so far as the present light of knowledge shines, they never will, guarantee reliable uniformity of results in every wheel made with the same metal and manipulation. In every considerable number of cast wheels made strictly according to specifications which would produce satisfactory wheels there always will be some in which imperceptible strains or hidden imperfections exist which will only develop in service. If any way can be discovered by which all cast wheels can be certainly made as good as the best there will be an end of the discussion, but this discovery has not been made yet.

As to smoothness of running. It is practically impossible to cast wheels which will be perfectly round and balanced when cool, the difference in radius often being as much as one-eighth of an inch. If they are ground true, so much of the chill will be removed in some places that they will soon wear uneven or shelly. It is to be feared that some "prejudice" has dulled Mr. Sanderson's sensibilities if he cannot readily detect the difference in the running of a car on cast iron wheels when he passes to it from one on good steel tired wheels. The writer's travels compel him to make this change frequently, and however engrossed in other matters, before he has been seated five minutes over the cast wheels his attention is attracted to the tremor of the car, which, after a time, is certain to produce a nervous agitation in his system that is to be felt for some time after leaving the cars. This must be a very serious exposure to those who are compelled to ride daily over cast iron wheels, and must soon attract the attention of those who have the care of our health. The wheels I refer to are on one of the best managed (except in regard to wheels) and largest roads in the country, and probably ground. Grinding may improve, but certainly does not cure the evil of want of balance and roundness.

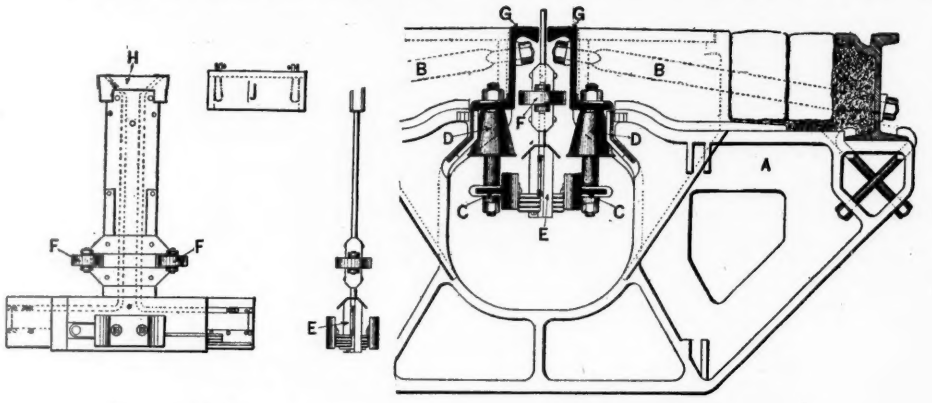


Fig. 2. *Fig. 1.*

The Walker Conduit for Electric Roads.

As to weights. We should say that a really first-class 33 in. wheel ought to weigh 650 lbs., and a 33 in. steel-tired wheel 750 lbs., the excess in the steel-tired wheel being only half as much as Mr. Sanderson gives it, and wholly due to the thickness of tire for the sake of mileage. It is, moreover, a rolling and not a dead weight to be hauled.

Upon comparative costs we differ entirely. In the first place we do not believe it is possible, even with the present cheap pig iron to make a first-class cast iron wheel to be sold at $5, or $.0083 per pound. The locomotive builders' price list is $8.50 for 33" cast wheels. Let us asume that the best cast wheels can be had at $7 each and that they are good for 60,000 miles, as stated, and that the steel-tired wheels cost $40 each with tire 2½" thick. The present open hearth tire with fair usage is good for 40,000 miles at least to the ⅛" of thickness, or 480,000 miles to a 2½" thick tire. Very many of these tires run over 600,000 miles, and some have made, and others are now running, at the rate of a million miles. The best steel tired wheels can be readily retired indefinitely in any railroad shop where a locomotive driver can be re-tired, and the value of the old tire is equal to the cost of re-tiring above the cost of the new tire. How does the comparative cost appear with one re-tiring?

First cost of a pair of steel-tired wheels	$80.00
Cost two new tires	40.00
Cost of 7 turnings and shop handling	10.50
Cost of 7 removals and replacements at 60c	4.20
	$134.70
Credit by price of two old wheels	10.00
Cost per pair for steel tired wheels to run 960,000 miles	$124.70

To make this mileage, 16 pairs of cast wheels would be required,

Costing (ground)	$230.72
Cost of 16 replacements at 60c	9.60
Cost of 16 shop handlings	3.20
Cost of 16 strippings, borings and remountings	4.00
	$247.52
Less value of 8 tons scrap wheels at $10	80.00
Net cost of cast-iron wheels to run 960,000 miles.	$167.52
Net cost of steel tired wheels to run 960,000 miles.	124.70

Difference in favor of the steel-tired wheels $42.82, or .043 per 1,000 miles run, and the wheel center should still be good for other re-tirings, which would reduce the cost of mileage. We have taken Mr. Sanderson's rates of costs, except for the value of old steel-tired wheels and tires. Mr. Sanderson displays some lack of consideration in his argument concerning what he terms "the other important item of cost to be considered, and that is rail wear." Steel tires are not made of "soft steel" at the present time. The study of the tiremakers is to make their tires as hard as is consistent with other good qualities and rarely allow their steel to run below .60 carbon, so that the wear of the tire and rail may be reduced to the minimum. A good tire in use glistens like a mirror, and wears the rail far less than the rough chilled iron.

Even if it should ever become practicable to secure iron of the tensile strength of 60,000 lbs. to the square inch "sometimes reached," according to Mr. Sanderson, the steel flange, as now made, can be relied upon to be always more than twice as strong.

Those who are satisfied to depend upon cast-iron wheels seem to me to fail to appreciate the supreme importance of securing the very best material at this vital point in railroad equipment. The whole railroad system of the world, its enormous traffic, its great collateral interests, its influence upon commerce, upon civilization, upon humanity, all result from the invention of the flanged wheel; they all depend upon the ability of a small rim of metal one inch and a quarter thick at its base and one inch and an eighth high around the tread of the wheel, to retain locomotive and cars on the line of rails. Without this little flange, railroads would be impossible. It is only as the flanged wheel is secure and reliable that railroads can be operated and prosperous. The lives of the millions who travel, the profits of the millions invested in railroads, all hang upon the security of the flange of the car wheel. It would appear to be self-evident from this standpoint that the very best product of mechanical skill and of science should be used in making this vital element of railroad success as strong and reliable as possible. Now, cast-iron has a tensile strength of about 25,000 lbs., and open hearth steel tires of about 130,000 lbs. to the square inch, or five times as great. Cast wheels must be used just as they happen to come from the molds. Steel tires are worked repeatedly under hammer and rolls until perfect uniformity of texture and strength is secured, and all imperfections discovered and removed. The cast-iron wheel, moreover, is chilled on its tread and flange, in order to harden the surface against inordinate wear. This chilling renders the metal brittle and more liable to break than the unchilled iron. The use of the brakes on wheels in service heats the tread and flange so that the molecules of metal around the periphery of a solid cast wheel, by repeated expansion and contraction, lose their original coherence, and the connection between the tread and center becomes weakened and liable to fracture. The chilled metal being changed in its nature or constitution from the unchilled, has a tendency to separate itself under the influences of wear and heat from the rest of the wheel. These and other considerations have led those roads which continue from mistaken notions of economy to use cast chilled wheels under their passenger equipment to adopt a general rule to remove all wheels which have made 60,000 miles, without regard to their apparent condition. The momentum of a 110-ton locomotive running, as some of our fast trains do, 60 miles an hour, is 9,680 foot tons. This is greater than the muzzle energy of a 700-lb. projectile fired from a 12-in. rifled cannon, which is given as 9,440 foot tons. When a locomotive running at this speed strikes a curve this tremendous impact falls upon the small point of contact between the edge of the rail and the flange of one wheel. Of course, if the blow were direct and the resistance absolute neither rail nor flange could withstand it; but those who have ridden on railroads around curves at high speed must have been impressed, as the heavy cars surged from side to side, with the supreme value of the flange. The immensely superior strength of the flange on a steel tire over that on a cast wheel may be easily demonstrated to the entire satisfaction of any one who will have a man knock off a piece of the flange of a cast wheel with a sledge hammer in his presence with one or two blows, and then have him exhaust himself striking the flange of a steel-tired wheel without breaking it.

An inspection of a lot of scrapped cast wheels, especially such as have been condemned in street car service, where the flanges are more exposed to con-

tact with obstacles, reveals to the eye very distinctly the large number of broken and ragged flanges which occur in service. But broken flanges, nevertheless, do not cause much over ten per cent., if so many, of the actual condemnations and scrapping of cast iron wheels. The "Code of Rules governing the condition of, and repairs to, freight cars for the interchange of traffic, adopted by the M. C. B. Association" in June, 1895, enumerates the following additional causes for removal of cast wheels, "sheeled-out spots, seams, worn through chill, worn flange, tread worn hollow, burst, broken rim, cracked tread, cracked plate, one or more cracked brackets, broke in pieces, flat sliding, chipped flange," which all together make thirteen faults common enough to be enumerated and expected in cast iron wheels; not more than one-half of this number could by any possibility occur to a steel-tired wheel.

The Railroad Gazette has published a list of railroad accidents with their causes in general, and the number killed and injured from "defects of equipment" and other causes for many years. From these reports I have condensed these impressive facts, estimating the numbers killed and injured in accidents from "broken wheels" to be proportionate to all killed and injured in accidents due to all "defects in equipment."

The total number of reported accidents due to broken wheels on railroads in the United States in the twenty-five years from 1872 to 1898 was 811, being 25.6 per cent. of all accidents attributed to defects in equipment. During the ten years ending Dec. 31, 1897, there were killed 423 persons, and injured 1,339 persons in such accidents. If only the 25.6 per cent. of the casualties are attributed to broken wheels, which are likely to cause the most serious results, in the last ten years, 108 persons have lost their lives and 343 have been injured in accidents due to broken wheels. The money cost can only be surmised. The Bradford accident on the B. & M. Railroad, Jan. 10, 1888, wrecked an express train of seven cars, killing 14 and injuring 50. This was caused by a broken cast iron wheel, as was demonstrated by the investigation of the railroad commissioners. Since the publication of their report the railroads of New England have virtually abandoned the use of cast iron wheels in passenger service, and the Legislature of Massachusetts has prohibited the introduction of new equipment with cast iron wheels upon the railroads of that state. The use of cast iron wheels is prohibited by law on the elevated railroad of New York.

Mr. Sanderson's use of these statistics is misleading and deceptive, as are the statistics of tire failures in Germany quoted from Mr. Griffin's paper. European tires and wheels are very inferior to ours. Wheels and tires are very light, and most of them very cheaply made. They are of all kinds of construction, most of the tires fastened on by a bolt screwed through the wheel rim into the tire, inviting fracture. A great majority of the tires are made of Bessemer steel. Those used in most of their traffic would not be considered safe under coal jimmies in this country. It is surprising that they have so few breakages as they report, and only to be accountable to their good roads, light loads and slow movement. These statistics can afford little information concerning American railroad practice.

Indeed, the conditions in this country have changed so greatly that our own experience in the past cannot be depended upon, except to direct attention toward the most hopeful methods. Our car loads have been increased from 10 to 30 tons, and the speed of our trains from 20 to 60 miles an hour in the last twenty years; rails, bridges, locomotives and cars have been or are being correspondingly increased in strength and weight. The wheel which has been good enough in the past is no longer to be trusted to carry these loads or resist the tremendous momentum of the blows it is liable to receive. We have had cast wheels returned which went into passenger service more than ten years before. We have steel-tired wheels which were put in service in 1883 still running daily, but we do not consider either type fit for present railroad use and have abandoned their manufacture. With a triple increase of load and speed, we have a ninefold increase of momentum.

The great question for discussion and decision, in the light of past experience and the advanced science and art of the present day, is this: What kind of a wheel can be most confidently depended upon to carry the loads and endure the present requirements of railroad service with perfect safety?

Theory demonstrates, and experience has proved, that some of the best cast chilled wheels that can be made are certain to fail at the critical and dangerous moment, notwithstanding the most careful tests and inspection; that such failures have been and are likely to be sufficiently numerous and destructive to keep this kind of wheel always in what may be termed the dangerous class, this certainty of imperfection in a percentage of all cast metal products seems to be inherent to the metal and unavoidable, and must always be calculated upon. The development of these imperfections in service is almost always sudden, complete and disastrous. We may, therefore, lay it down as an axiom that perfect safety cannot be secured where cast wheels are generally used. It would appear to be rational and prudent, therefore, not to depend upon a kind of wheel with which accident is actually certain and probably too frequent. It borders very closely on criminal culpability to persevere in the use of this class of wheel when another kind can be obtained which is theoretically absolutely safe, and which the experience of many roads and years has proved reliable. This the writer conceives to be a fair statement of the case against the use of chilled cast-iron car wheels, and conclusive.

There is a steel-tired wheel on the market which is theoretically perfectly safe and reliable under present conditions of railroad service, which theory the last five years of experience substantiates. The center of this wheel is a plate center forged out of wrought iron, the making and finishing of which affords ample opportunity for the maker to discover whether it is perfect or not. If it is a sound forging, it cannot be broken by any strain or accident to which it may be exposed in service. Forged plate centers have been in service many years, and there has never been a single failure. The tire and flange of this wheel are made of rolled open hearth steel carefully constituted of the chemical elements best calculated for strength and durability, and examined in the various processes of manufacture for evidence of fault or weakness. Sufficient experience has proved it absolutely secure so long as it is kept in proper shape and condition. This tire is fastened upon the center so as to obtain the largest bearing on it, by a secure circumferential locking device which gives a continuous fastening all around the center without the necessity of bolts or any other part liable to become worn or loose. Any sign of weakness or failure which might occur in service will be readily discovered by the usual inspector in time to prevent accident, because there cannot be any sudden complete fracture or failure. The nature of the metal and the method of fastening assure this. We have in such a wheel as near absolute safety as can be attained. The tire can be easily removed, if need be, in any railroad shop where locomotive tires are fixed upon the drivers, and a new tire substituted for it, so that the cost is reduced to that of the metal worn out in service. This tire is made of the best material known for strength and wear. With such a wheel which has been in service for years without a failure, railroads may obtain, with proper inspection, complete immunity from accidents caused by broken wheels. When such a wheel can be had it does not seem wise economy to depend upon the uncertainties of cast iron, even if there were considerable saving in first cost, and good cast iron wheels are to be had at $5 each, or even less. Theory and science have demonstrated and experience has proved in thousands of ways that cast iron cannot be made strong enough, or cast chilled wheels uniformly reliable enough to satisfy the tremendous requirements of our present railroad service.

H. M. BOIES.

Scranton, Pa., May 9, 1898.

Classification of Pennsylvania Locomotives.

About a year ago Mr. Casanave issued a new classification of the locomtives of the Pennsylvania Railroad. This became necessary because the original method of classifying by single letter did not permit a separate letter for each general type and for the subsequent modifications of that type. Therefore, there were a considerable number of locomotives (of class O, for instance, or class P) which had to be further designated by diameters of boilers, diameters of driving wheels, etc. The present classification is as follows:

Class A—Locomotives with 2 pairs of drivers and no truck.

Class B—Locomotives with 3 pairs of drivers and no truck.

Class C—Locomotives with 4 pairs of drivers and no truck.

Class D—Locomotives with 2 pairs of drivers and 4-wheel truck.

Class E—Locomotives with 2 pairs of drivers, 4-wheel truck and trailing truck.

Class F—Locomotives with 3 pairs of drivers and 2-wheel truck.

Class G—Locomotives with 3 pairs of drivers and 4-wheel truck.

Class H—Locomotives with 4 pairs of drivers and 2-wheel truck.

These primary letters designate the type. To these numbers are added to designate the different classes of each type and further small suffix letters are added to designate modifications of any particular class. Thus we have class B4a. This was formerly Class M, type of 1893, being a 6-wheel switcher; and we have Class H3b, which was formerly Class R, type of 1893, being a consolidation engine.

This rearrangement makes it possible to expand the classification almost indefinitely.

Together with this designation of the classes and types are issued tables giving the principal dimensions and characteristics of each. For instance, under Class H3b, already referred to, we find tabulated 42 different items giving diameter of drivers, size of journals, wheel base, weights, heating surfaces, sizes of ports, etc.

The Gold Improved Electric Heaters

In our issue of Feb. 11 we described and illustrated the arrangement of the Gold improved electric heaters in the cars of the South Side Elevated, Chicago. We present herewith illustrations of this heater. In

Fig. 1.—Resistance Coil and Support, Gold Electric Heater.

Fig. 1 is shown the resistance coil and support. Heretofore the coils have been clamped between grooved plates, and, although the heaters thus made were very successful, yet the improvement as here shown is believed to be of considerable value, and departs from anything that has ever been attempted. This support is made of a quarter-inch steel rod, which is thoroughly covered with an insulating enamel which is burned on the rod at a temperature of over 2,000 deg. F., and is therefore not affected by any temperature which would be used for heating the car. The resistance coil is slipped on the spiral, and when in place assumes the form shown in the illustration.

Special attention has been given to the composition of the resistance wire used in these coils. The coil is wound on an open pitch, so that when it is placed on the spiral rod the wire is in its natural position, and is not subjected to any strain, having only tension enough applied to it to keep it firmly in place. Should the wire break, it would be held fast on the supporting rod, which is an advantage over those forms in which the wire is wound around a core under tension, inasmuch as in the latter case a short circuit will be made with the heater casing should the wire be broken.

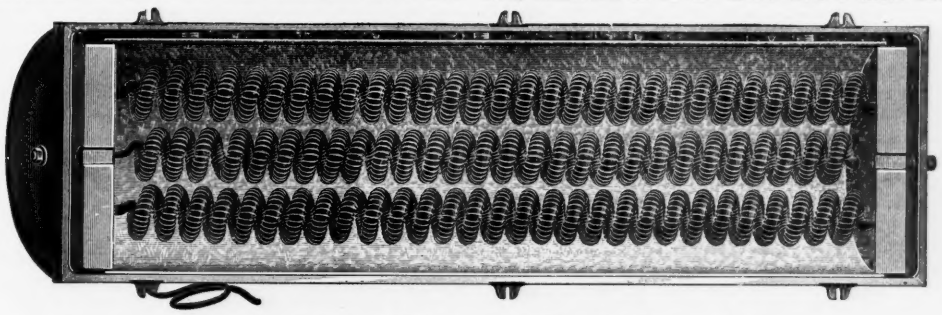


Fig. 2.—Interior View of Gold's Improved Three Coil Electric Heater.

Fig. 2 shows the improved form of the three-coil panel heater. The front of this heater is designed to be placed under the seat flush with the panel. Different designs of casings are made for this style, also for the single-coil panel heater, which is of the same general type as the one above described. These heaters are lined with asbestos and have an air space provided at the top, as shown in the cut.

The company recommends the use of 10 or 12 of the single-coil heaters in cars from 20 to 30 ft. in length. A two-point switch can be used in connection with this type, supplying two gradations of heat. For smaller cars six of these smaller heaters are recommended as capable of performing the required service.

Service Tests of the "Diamond S" Brakehoes.

In our issue of Sept. 24 last was described the "Diamond S" brakeshoe, made by the Sargent Co., Chicago, while Nov. 26 the results of tests made on the M. C. B. brakeshoe testing machine at Wilmerding, Pa., were published. It was stated at that time that service tests then in progress on different roads indicated that the wear given by one "Diamond S" brakeshoe would equal that of about four ordinary plain cast iron shoes. The ordinary cast iron shoe, it should be remembered, is just about as hard as can be made without chilling the iron.

Since the time mentioned, the Sargent Co. has tested these shoes on many roads, and a mass of valuable data has been collected. Recent results of road tests go to show that the ratio of the wear of the "Diamond S" shoes compared with the wear of hard cast iron brakeshoes is greater than four. The latest tests were made in passenger service on the Northern Pacific and the Great Northern, where a

direct comparison was obtained between "Diamond S," Congdon and plain cast iron shoes. In both cases the test cars were run between St. Paul and Winnipeg, the distance between these points by the Northern Pacific being 482 miles, and by the Great Northern 506 miles.

In the Northern Pacific test passenger coach No. 876, with 36 in. steel-tired wheels, was put in service Jan. 6 fitted with 4 "Diamond S," 2 Congdon and 2 plain cast iron shoes; this test was completed April 6. Passenger coach No. 139, with 42 in. steel-tired wheels, was similarly fitted up for the Great Northern test, which commenced Dec. 21 and lasted until March 24 last.

The diagrams show graphically the relative service by days, while the following table gives the complete results:

Results of Road Tests.

Kind of brakeshoe.	Number of Wheels Braked.	Weight of brakeshoe, pounds.			Average service by		Average wear per 1,000 miles.	
		New.	Removed.	Net.	Days.	Miles.	Pounds.	Relative to "Diamond S."
Northern Pacific Railway, 36 in. Steel-Tired Wheels.								
"Diamond S"	4	26.0	10.5	15.5	90	27,956	.55	1.00
Congdon	2	22.0	11.5	10.5	39	11,568	.91	1.66
Plain cast iron	2	26.0	12.0	14.0	17	5,013	2.80	5 09
Great Northern Ry., 42-in. Steel Tired Wheels.								
"Diamond S"	4	31.5	17.5	14.0	93	28,362	.48	1.00
Congdon	2	29.25	18.5	10.75	45	13,900	.78	1.62
Plain cast iron	2	31.5	17.0	14.5	21	4,500	3.22	6.71

It will be noticed that the results agree with each other quite closely considering the variations which are apt to occur in service tests; also that the wearing qualities of the "Diamond S" brakeshoes are in one case 5.09 and the other 6.71 times those of plain hard cast iron shoes. The Wilmerding tests showed that the friction of the "Diamond S" shoe was slightly greater than similar hard cast iron, so that the greater wear obtained by the insertion of the expanded metal is not at the expense of the friction. The results of these tests are particularly important, as the wear and first cost are the most important factors to be considered after it is known that a brakeshoe gives sufficient retarding power without injury to the wheels.

The Massachusetts Investigation of Street Railroads.

The special committee appointed by the Governor of Massachusetts last year to investigate the relations between towns and street railroad companies has just issued its full report. This committee consisted of Charles Francis Adams, William W. Crapo and Elihu B. Hayes, and the principal part of its report was given in the Railroad Gazette of Feb. 11 and Feb. 18, pages 102, 121, 122, and 124. The bills drafted by the committee, in pursuance of its recommendations for changes in the laws of the state regulating the relations between municipalities and street railroads, and the taxation of such roads, were summarized in the Railroad Gazette of Feb. 25.

The appendices contained in the volume now issued make a valuable addition to the report as published in February. First, we have the report of the Secretary, Walter S. Allen, filling 26 pages, laying down what may be called the ground work of the committee's report. This summarizes the state of legislation throughout the Union, as well as in Great Britain, and in general gives the situation with which the committee had to deal. Appendix B gives abstracts of the statutes of the various states in relation to franchises and methods of taxation. This fills 48 pages. The next 25 pages are taken up with accounts, of one or two pages each, showing the conditions in American cities, to wit: Albany, Baltimore, Buffalo, Chicago, Cincinnati, Cleveland, Detroit, Indianapolis, Philadelphia, Providence, Richmond, St. Louis, Montreal and Toronto. Appendix D. shows in the same way the conditions in Europe. Investigations were made in Great Britain, Germany, France, Belgium, Holland, Italy and Austria. Of British cities we have accounts of Birmingham, Bradford, Leeds, London, Manchester, Norwich, Sheffield, Glasgow and Dublin, and in the countries of the Continent we have Berlin, Frankfort, Hamburg, Paris, Rouen, Amsterdam, Milan and Vienna. The opening part of the chapter on "Conditions in American Cities" is given below.

The book also contains a paper by Robert P. Porter on Municipal Ownership and Operation in England, which was read before the committee. This paper fills 55 pages, and contains many statistics. Other appendices show the effect on each town in Massachusetts of the proposed changes in the methods of taxation of street railroads.

Press dispatches from Boston last week indicated that the recommendations of the committee are not likely to find favor with the Legislature. At such a late stage in the session the members are disinclined to take up any important question on which there are radical differences of opinion, and therefore this report, with the valuable special report recommending changes in the general tax laws of Massachusetts, are expected to go over until next January, at least.

Conditions in American Cities.

From a general view of the street railway business of the United States, the service given and rate of fare charged seems to be the cause of most of the friction between street railway corporations and municipal authorities. A closer view discloses the fact that wherever electricity is used as a motive power the equipment is new, the speed has been much increased, and the service rendered the public is generally satisfactory. The nearly universal five-cent fare, with free transfers, appears to meet the general approval of the public, and to prove profitable and satisfactory to the corporation managers. Even in localities where the experiment of a three-cent fare has been made and abandoned, there did not appear to the committee to be a pronounced public sentiment demanding the lower fare. The corporation managers pronounce it a financial impossibility.

It was the practice of the committee, in visiting an American city, to first interview the municipal authorities, the Mayor, and the officials in charge of the streets and public treasury. Although public complaint would naturally center in the city halls, it was more frequently claimed by the officials seen that their particular city had the best city railway accommodations in the country than that the service was poor.

As to fares, the opinion was freely expressed by private citizens and public officials that five cents, with free transfers that would take a passenger across the city, in some instances as far as twenty miles, was a low enough fare.

The railway officials were next interviewed by the committee. In regard to the above important and much-discussed points, they invariably corroborated the opinions expressed by the city authorities. Some of the managers stated that, although the road had adopted the free transfer system reluctantly, they had found that the general business of the corporation, and its profits also, had been improved by the change.

With a good service and fares generally satisfactory to corporations and their patrons, it would seem that the relations between the municipalities and the corporations could not be other than peaceful. But the committee found other causes of dissension. Wherever there was a term franchise about to expire there was strife. In one instance there was a bitter contest in progress over the attempted readjustment of a franchise that had yet sixteen years to run. Wherever there was divided responsibility in the care or construction of streets there was contention. Wherever there was more than one company operating in the streets of a city, there was liable to be a contest, generally over grants for extensions. The worst conditions were found in localities where rival companies were contending for grants in public ways. These contests often lead to corruption in public life, and to such bitter political feuds that the public interests suffer. In several states, notably Rhode Island, Michigan, Ohio and Indiana, phases of the street railway problem have recently been the leading political issues in city and state. Three of the Mayors in important American cities visited were elected because of their attitude on street railway matters. The political cry has frequently been "cheaper fares," but the underlying cause of real hostility to street railway transportation business seems to be a general feeling that public ways are being used for individual profit, that grants to street railway corporations are not properly paid for, and that questionable methods are often adopted in obtaining them. Whether well founded or not, the evidence of this public sentiment is unmistakable, and affords a fruitful field for political agitation and contention.

The attempts made to secure from the companies compensation for the use of public ways are so varied as to be puzzling. No two contracts are alike, and there is no uniform system of state taxation. The streets in many Western cities do not bear the same financial relations to the public as exist in Massachusetts. Here, the public ways are constructed and maintained from the general tax fund; there, the cost of grading, paving, and all construction of new public ways is at the expense of abutters. Even the reconstruction of streets by the substitution of a new kind of pavement is paid for by the owners of adjoining property, and only maintenance is paid for by the municipality.

In many states stocks and bonds of street railways are not taxed, either by local or state authorities. A special tax, known as a vehicle tax, is imposed by many municipalities in the form of a carriage license for the use of the streets. This system appears to give satisfaction, and yields a large revenue.

While there is no revenue system that can be said to have been entirely successful in its operation, the plans to secure financial returns for the use of public ways which have not worked well are easily noted. A direct tax on street cars as a license has usually been much evaded, and generally results in restricting the service. A tax on net earnings leads to contests between the corporations and municipalities as to what net earnings are. To require the street corporations to pave and care for public ways does not seem satisfactory to either side. On the other hand, taxes on real property and gross earnings appear only to afford opportunity for dispute and discussion as to the rate. That fixed, the plan does not cause friction in practical operation.

The committee found no strikes or important labor disturbances in progress. Payment of a fixed sum per hour for wages seemed the plan most generally approved. The price for labor on street railways in the different cities was found to be much more uniform then is generally supposed. . . .

Street Railroads in Pennsylvania.

The annual report of the Secretary of Internal Affairs of the State of Pennsylvania, giving statistics of the railroads, canals, telegraphs and telephones of the State, gives the following statistics of the street railroads of the State for the year ending June 30, 1897:

Capital stock	$143,489,309
Funded debt	42,812,430
Current liabilities	34,266,976
Cost of road and equipment	118,250,014
Gross earnings	18,879,649
Other income	8,516,840
Operating expenses	10,075,644
Taxes	1,567,335
Interest on funded debt	1,919,084
Rentals, etc.	8,679,006
Dividends	5,214,784
Miles operated	1,552
Motor cars	4,914
Other cars	499
Employees	12,079
Passengers carried	409,723,418

Eighteen passengers, 4 employees and 71 other persons were killed, and 519 passengers, 71 employees and 364 other persons were injured during the year.

Navigation of the Volga.

The river Volga maintains its importance as a transportation route better perhaps than any other long river, though it has the great disadvantage of running the wrong way—that is, it discharges into the isolated Caspian Sea, surrounded largely by desert, and the great bulk of the shipments on the Volga—grain from its own valley and petroleum from the banks of the Caspian, with not a little fish from Astracan and the river itself—must be carried up stream to market. It has been an important commercial route for ages; but before the introduction of steam, about 1830, grain shipped from its lower course could not be got through to the head of navigation (about 150 miles north of Moscow) until the year after it was harvested. Ten years later shipments were carried through, a distance of 860 miles, in 16 days. The stream now has its channel buoyed throughout, and it is provided with the requisite lights.

In 1892 the number of steamboats on this river was 1,096, with 498 owners, few belonging to companies. There are about 12,000 vessels other than steamers, and these are for the most part towed. The only fuel used now is petroleum residuum.

It is proposed to connect the Volga with the Don by ship canal. This would give it an outlet to the Black Sea and the rest of the world. At one point the two rivers are but about 35 miles apart. From this point the Volga flows southeast to the Caspian, while the Don flows southwest by west to the sea of Azof.

Grain Transfer and Weighing Car for the Chicago, Indianapolis & Louisville Railway.

For a number of years it has been the practice of the railroads to transfer grain going east from the cars of the delivering Western road to cars of Eastern roads at points where the delivering roads end. This practice necessitates building grain elevators or paying for weighing and transferring grain by outside parties.

The drawings shown in the accompanying illustrations are of a car patented by Messrs. Richardson and Loomis, of Chicago, to take the place of grain elevators for transferring and weighing purposes. The car shown was built by the Wells & French Company, of Chicago, for the Chicago, Indianapolis & Louisville Railway, the Link-Belt Machinery Company furnishing the grain handling machinery. The advantage of such a car over an elevator is that the space occupied is much less, it can be moved from one point to another as needed, and the first cost of the car is less than that of an elevator.

Fig. 1 is a longitudinal view of the interior, the side of the car being removed. The length of the car over end sills is 48 feet, the width over end sills 11 feet and the height between sills and plate 12 feet 5 inches. A vertical engine and boiler capable of developing 16 horse power supplies power for the machinery. By means of a lever, A, working a friction clutch on the engine shaft, the engine can be disconnected from the operating machinery. On the shaft coupled to the engine is a worm which, by means of a lever, B, engages a gear which in turn is connected by a link belt to the car axle, so that the engine can be used to move the car along the track. A link belt from the engine shaft drives the line of shafting above the car, which drives the elevators. The lever C operates a friction clutch in this

shaft, enabling all the machinery to be run, excepting the elevators.

E is a countershaft carrying the mechanism for operating the scoops used for unloading grain. This apparatus is in common use for unloading grain cars. The man operating a scoop inside the car pulls back on the rope attached; this throws a clutch on shaft E into play and the rope is wound up on the drum, dragging the loaded scoop to the car door. As soon as the tension is off the rope the clutch is released and the scoop can be dragged again into the car.

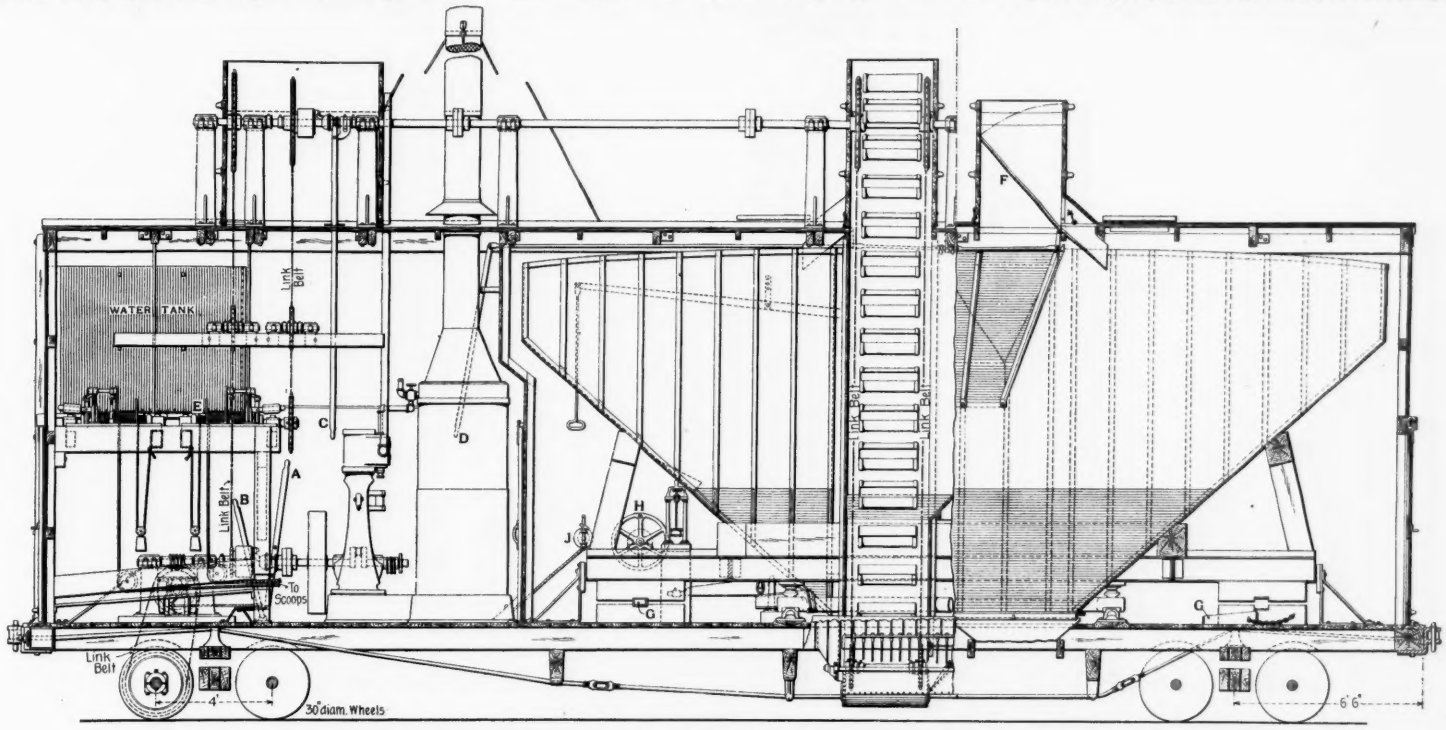


Fig. 1.—Grain Transfer and Weighing Car, Chicago, Indianapolis & Louisville Railway.

The car is provided with two elevators, one in Fig. 1 being left off so as to show the arrangement of the grain bin. Grain is unloaded from the cars into the boot of the elevators. The buckets carry the grain to the top of the elevator and from this point it can either be sent into the receiving car or into the bin, depending upon the position of the door F, which is controlled by the lever D.

The bin has a capacity for 1,600 bu. of oats and rests upon Howe scales, which will register up to 100,000 pounds. When the scales are not in use the wedges G G (Fig. 1) are inserted and carry the weight of the bin. The opening in the bottom of the bin is controlled by a slide operated by a hand wheel H. J is a small drum, worked by hand, which regulates the position of the spout in the car being unloaded.

A carload of rye or wheat can be transferred in 12 minutes and a car of oats in from 20 to 30 minutes.

Similar cars are in use on the Lake Shore & Michigan Southern, Pittsburgh, Fort Wayne & Chicago, Pittsburgh, Cincinnati, Chicago & St. Louis and Chicago & Erie.

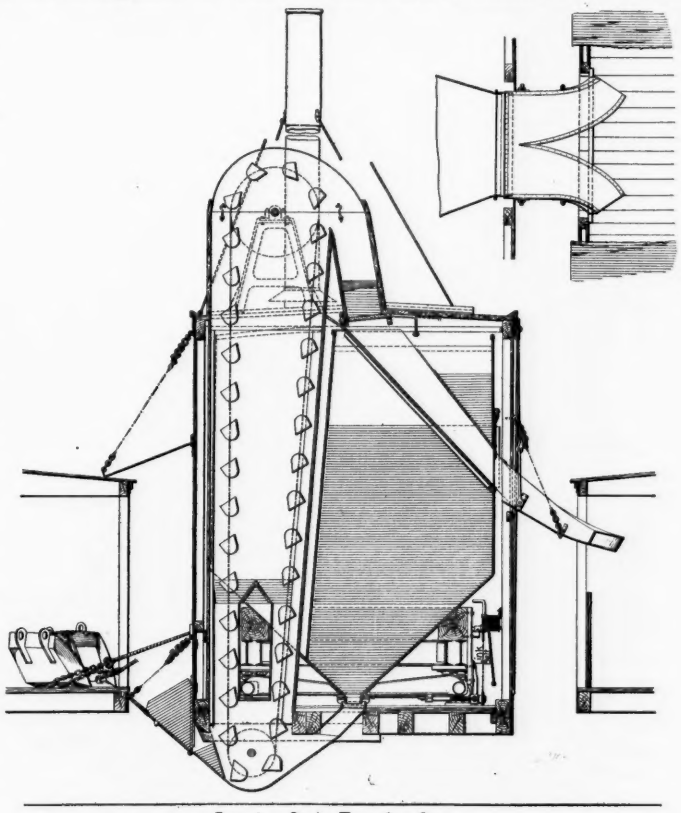


Fig 2—Grain Transfer Car.

We are indebted to Mr. E. E. Loomis, Freight Agent of the Chicago & Erie, who is part owner of the patents, for drawings of this car.

Compressed Air Motors on Metropolitan Street Railroad.

The Metropolitan Street Railway Co. of New York has finally made a contract with the recently organized American Air Power Co. of New York for the complete equipment, including 20 compressed air motors of the same size and external appearance as the Broadway cars. These motors were fully described and illustrated in our issue of Dec. 31 last. A new power house will be built on the property of the Metropolitan Company in West Twenty-third street, opposite the Pennsylvania terminal. The air compressor for which order has been placed is of 1,000 H. P. capacity and is of the Ingersoll-Sergeant four-stage single-acting type provided with intercoolers between each pair of cylinders, and a final cooler after the fourth stage cylinder. The air cylinders are to be vertical and will be set underneath the engine, which is a vertical cross-compound condensing Reynolds-Corliss engine, built by the E. P. Allis Company.

The American Air Power Company, which was formed by the combination of the Hoadley-Knight and Hardie Companies, has a capital of $7,000,000. Its President is A. A. McLeod, formerly President of the Reading Railway and the Boston & Maine, and its directors are William L. Elkins, Thomas Dolan, Thomas Ryan, Joseph H. Hoadley and A. A. McLeod. Its relations with the Metropolitan Company have been very intimate, and for several months past part of the power house at 146th street and Lenox avenue has been used by the Air Power Company for experimental work. Several cars have been equipped with air motors there and have been successfully run over the Lenox avenue line.

The Buluwayo Railway, South Africa.

Mr. Francis Fox, a well known English engineer, who was present at the opening of this railroad a few months ago, describing the line in a communication to the Bechuanaland Railway Company, says that great judgment has been exercised in the location, resulting in the avoidance of exceptionally heavy earthworks. Mr. Fox traversed the line between Kimberley (Vaal River) and Buluwayo. About Lobatsai the country passed through is difficult; but even here the earthworks, chiefly in rock, have been reduced to a minimum. The curves and gradients are well suited to the country. In order to expedite the opening the railroad was temporarily laid across the river beds at Magalapsye, Shashi, Khami and other places. Permanent bridges are being erected, and the sleeper gradients necessary for the temporary location will, when they are completed, be done away with. The bridges have superstructures of steel of the Cape Government standard of strength. Contrary to the view held by some people, that the line is merely a light railroad, when the bridges are added it will be equal in all respects to those of the Cape Government system.

The gage is 3 ft. 6 in.—the Cape standard—and the permanent way is laid with the heavier type of steel sleeper and with steel rails 60 lbs. to the yard. Owing to careful manufacture and inspection the permanent way details were an excellent fit, and came together readily, very much facilitating the rapid progress of the work. At the time of Mr. Fox's visit most of the permanent way was finally keyed-up. The complete ballasting must be a question of time, but the road should be in permanent working order early next year. When this has been attained and the facing points duly protected a considerable increase of average train speed will be practicable. The railroad is ballasted completely between Mafeking and Mochudi, while from Mochudi to Palachwe the necessary ballasting is in hand to comply with the requirements of the imperial engineer, Major Panzera. From Palachwe to Francis Town it is also in progress.

The trains which ran for the opening ceremony were composed of the saloon sleeping car carriages of the Cape Government Railways, 60 ft. in length, and in some cases the total length of the train was nearly 900 ft. The most serious want of the whole district is a good and permanent supply of water, both for station and locomotive purposes. The last 500 miles of this important road was built in 400 working days.

Foreign Railroad Notes.

In Berlin a Rapid Transit Commission, if we may so call it, has recommended that a system of underground railroads be built by the city, the working of which shall be let to corporations—just what was proposed here.

So many of the employees at the general offices of the Bavarian State Railroads use bicycles to go between their homes and their offices (in Munich) that the management has had sheds built, with stands for 56 wheels, and these stands are rented at the very moderate rate of one mark (24 cents) per year to the employees who want them.

The transportation of hay has been becoming important in Russia, and recently low rates have been established, beginning at 0.65 cent per ton per mile and falling for distances over 140 miles, to 0.415 cent. But these rates are for the full car capacity, which can be reached only with pressed hay; and as there are few such presses among the farmers, it is proposed to require the railroad to keep presses at certain stations and press the hay for shippers. It is said that one road has begun the practice and found it advantageous.

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EDITORIAL ANNOUNCEMENTS.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially either for money or in consideration of advertising patronage.*

When we talk of the probable action of any kind of equipment construction in a collision or a derailment, one stock reply is that cars are built as vehicles and to run on a track, and not as instruments of attack or defense or to run in a ditch. This sounds rather smart, but it is only partly true. No railroad in the world has yet succeeded in absolutely abolishing collisions and derailments. So far as we can see, cars will have to be built with regard to accidents as well as to perform their proper special duties. These words are suggested by a recent collision on the Pennsylvania Railroad which involved as chief actor the Chicago Limited. A passenger train, at forty miles an hour, ran into a work train, and no one behind the tender was injured. Four cars were derailed, but there was no breaking up any of them. Ten years ago a dozen lives would probably have been lost in that passenger train. Considered from this point of view, this accident was a remarkable one; otherwise, it was of no great significance, and occurring on almost any other road or to any other train would have attracted little attention. The cars which make up this train are, of course, the latest results of the art of car building. The platforms were but little injured, and there was no riding of one over the other; in other words, no telescoping. The vestibules obviously had something to do with this result in that they helped to keep the cars in line; but probably the chief agent was the robust, well designed, steel platform.

Railroad Earnings in a Silver Country.

One of the bad effects of a depreciated currency is the false ideas of things which it gives. When gold was at 250 premium during the war, the farmer who had esteemed himself simply comfortable with a farm worth $10,000 was apt to think himself rich and beyond the need of saving because he could get $25,000 in greenbacks for it, though he could buy no more with the $25,000 in greenbacks than he could have bought for the $10,000 in gold before the war. One of our associates who had the misfortune to be a prisoner near the close of the war actually expended some thousands of (Confederate) dollars for a single meal. The depreciation of silver is now having a similar effect in Mexico and other countries. The Mexican Central Railway reports earnings per mile, in Mexican currency, for the last seven years as follows:

1891.	1892.	1893.	1894.	1895.	1896.	1897.
$4,169	$4,146	$4,322	$4,530	$5,069	$5,352	$6,552

This looks like a tremendous growth of business, the earnings per mile having been $2,406, or 57 per cent. greater last year than in 1892. But a large part of its supplies and its interest charges have to be paid for in United States currency, and the cost of an American dollar in Mexican currency has increased from $1.29 in 1891 to $2.09 last year, and reducing the Mexican to American currency at the rates of exchange which the company has had to pay in the several years the Mexican Central's earnings per mile in gold have been:

1891.	1892.	1893.	1894.	1895.	1896.	1897.
$3,236	$2,896	$2,701	$2,351	$2,683	$2,837	$3,129

Thus, instead of the continuous increase since 1892 indicated by the statement in Mexican dollars, we find a rapid decrease from 1891 to 1894, when the gold earnings per mile were $885, or 27 per cent. less than in 1891, while the silver earnings were $361, or 9 per cent. more. Since 1895 the gold earnings have increased largely, $778, or 33 per cent., which, however, is very different from the increase of $2,022, or 44 per cent., in the silver earnings, and last year's earnings per mile in gold were actually less than those of 1891, though in silver, as we have seen, they were no less than 57 per cent. greater.

It may be said that the company pays Mexican currency for wages and for some of its supplies, which is true, and, if the prices of these have not appreciated with the depreciation of currency, in so far the reduction of the silver earnings into gold exaggerates the effect of the depreciation. In a country like Mexico many prices are fixed by custom to an extent which would not be possible in this country, and probably, on the whole, silver has gone down there faster than prices of labor and domestic products have gone up. But that the gain in the profits of the road has been very much less than is indicated by the great gain in currency earnings is clear from the fact that, while these profits lacked $546,400 of meeting the charges in 1894, they lacked $538,947 in 1897, the deficit for five successive years having been:

1893.	1894.	1895.	1896.	1897.
$546,401	$814,185	$265,252	$483,011	$538,947

Thus we are again brought back to the fact that it is the nature of a depreciated currency to lie,—Q. E. D.

Two Air Brake Decisions.

On the 9th inst. two decisions of some importance were given in suits brought by the Westinghouse Air Brake Company against the Boyden Brake Company and the New York Air Brake Company, and both were against the Westinghouse Company.

The first which we shall consider was the Boyden suit. This was decided in favor of Westinghouse in the United States Circuit Court for the District of Maryland in 1895; in favor of Boyden in the United States Circuit Court of Appeals, Fourth Circuit (sitting in Richmond, Va.), also in 1895; and now in favor of Boyden in the Supreme Court of the United States. In this last decision five justices sign the decision for Boyden and four dissent; as will be seen, the point in question was a close one.

In this case Westinghouse brought suit for infringement of claims 1, 2 and 4 of patent No. 360,070, dated March 29, 1887. This is the earlier of the two most important quick-action patents. The claims in question are:

(1) . . . the combination of . . . a triple valve and an auxiliary valve . . . independent of the main valve . . . for admitting air . . . directly from the main air-pipe to the brake-cylinder . . .

(2) . . . a triple valve having a piston . . . which by a further traverse admits air directly from the main air-pipe to the brake-cylinder . . .

(4) The combination, etc. . . . and an auxiliary valve . . . controlling communication between passages leading to connections with a main air-pipe and with the brake-cylinder . . .

The Circuit Court held that the Boyden valve has no auxiliary valve, independent of the main valve, and therefore does not infringe claims 1 and 4; but that it does infringe claim 2 in that it accomplishes the same results by means that are functionally equivalent.

The Court of Appeals sustained the lower court as to claims 1 and 4, but reversed it as to claim 2. The lower court held that the Boyden device was the functional equivalent of the Westinghouse as described in claim 2; that both depend upon the extreme traverse of the piston for venting the train-pipe; and that the use of the further traverse for this purpose was new and unusual. The Appellate Court held that functional equivalence, merely, is not enough to sustain even pioneer inventions. Thus the Westinghouse suit failed on claim 2 before this court, and it was held that claim 2 was fatally defective in claiming only a result and not identifying the specific means.

The opinion of the Supreme Court we have not seen, and therefore shall not attempt to guess at the line of reasoning which led to the final defeat of Westinghouse on this suit in that court. Obviously it is out of place for us now to say what we think of the mechanical or commercial aspect of this decision. The status of the Boyden device which was in suit now depends upon its success before another kind of court—the railroad officers who are responsible for the safe and convenient working of all the great machinery intrusted to their care.

The second decision, also given on the 9th, was in the United States Circuit Court, Second Circuit, sitting in New York, Wallace, Circuit Judge. It was in a suit brought by Westinghouse against the New York Air Brake Company. Infringement was alleged, by the New York triple "C," of certain claims of patent No. 382,032, May 1, 1888, to Theron S. E. Dixon, and of patent No. 538,001, April 23, 1895, to Geo. Westinghouse, Jr. The New York triple valve "C" secures the quick action by venting the train-pipe to the outside air instead of into the brake-cylinder, as does the Westinghouse standard quick-action valve. But the Dixon patent (owned by Westinghouse) vents to the air, as does the Westing house patent No. 538,001, and under these suit was brought. But "Dixon was not the first to effect a local discharge in automatic air brakes by venting them to the atmosphere." Westinghouse himself, in one of his earlier patents, No. 217,838, had done this, but abandoned it in practice for what he considered the more useful and efficient plan of employing the vented air in the brake-cylinders. Thus Dixon was not a pioneer and his claims must have a narrow and technical interpretation, and the mechanism of the defendant appears to the court dissimilar enough from Dixon's to avoid infringement under such an interpretation. And, further, the second patent in suit (No. 538,001) "is not infringed unless the claims are given a construction not warranted by the specifications." So, finally, the suit is dismissed with costs.

It is easy to see that defeat in this suit might have been serious for the New York Company, considering their loss of recent suits in which other devices were concerned. The direct value of the victory, however, depends upon the success of an appeal, which we understand will be taken, and upon the performance in service of the valve in suit. On this, as on the merits of the Boyden mechanism, we do not feel called upon now to express an opinion. We have tried only to state the main facts of these two cases for the convenience of the reader who cannot readily dig them out for himself.

Mexican Foreign Trade.

The construction of the harbor at Tampico, and of the branch of the Mexican Central Railway leading thereto, have gone far toward revolutionizing the foreign commerce of Mexico. This is not so great a revolution as might be thought, for the whole foreign commerce of that country amounted to only about $97,000,000 last year, which is about equal to the foreign commerce of the United States for 17 days of last March. Heretofore substantially the only Mexican port on the gulf was Vera Cruz.

Imports on an appreciable scale began at Tampico in 1893, when they were 108,066 tons there, against 179,253 tons at Vera Cruz. For the last two years Tampico has led, with last year 373,807 tons, against 220,583 at Vera Cruz. But the notable thing is that, while Tampico has so far surpassed Vera Cruz in bulk of imports, the trade of the latter city has not decreased, but has increased largely, being nearly one-fourth greater in 1897 than in 1893. The imports by rail by way of El Paso decreased greatly after 1893 until last year, when they were 3½ times as great as in 1896, and much larger than ever before. But all the figures are small, and a small trade in coal would exceed in bulk the whole Mexican imports.

Their growth in recent years probably is due very largely to the importation of bulky goods which, at old-time rates, could not pay the freights. And the tables of values of imports indicate that Vera Cruz has lost less of the European import trade, which is chiefly of comparatively valuable manufactures, than the figures for the tonnage of Tampico imports might lead us to believe; for last year the 220,583 tons imported at Vera Cruz were worth $14,036,136 (gold), while the 373,007 tons imported at Tampico were worth but $8,773,275—the average value of imports per ton being $64 at Vera Cruz and $23.50 at Tampico. The El Paso imports are also comparatively cheap goods ($24 per ton). It may surprise some to learn that the imports into Mexico are much less at El Paso than at the other American gateways, 60 per cent. more (in value) going through Eagle Pass, and also 60 per cent. more through Laredo.

All this regards imports. The exports, in bulk, are very much smaller, but more valuable—just the opposite of our imports and exports. Our imports, however, are more valuable than our exports in proportion to bulk, because we export chiefly raw materials and import manufactured goods. In Mexico the high average value per ton of exports is due to the fact that they are predominantly ore and bullion. Their aggregate bulk is insignificant. Tampico, Vera Cruz and El Paso together exported last year only 282,518 tons, which is less than the yearly shipments of

many a third-rate American city. But these 282,518 tons were worth $83 per ton in gold ($174 in silver, in which currency they are reported). The exports at these three places were 63 per cent. of the value of the total Mexican exports.

While Tampico is far below Vera Cruz in the value of its imports, it exceeds it by one-third in value and by 210 per cent. in tonnage of exports; but that is because Vera Cruz hasn't any, so to speak, a beggarly average of less than 100 tons per day—not enough to load a respectable steamer once a month. But this is in the nature of things, probably. We are apt to look upon the City of Mexico as a primary market for the produce of the country surrounding it, but it is so only for its own supply. Mexico is in a basin, and if the agricultural country surrounding that basin should ever produce largely for export it would not be likely to ship such produce down into the City of Mexico, thence to be laboriously hauled up out of it, but rather directly to the sea, so that Vera Cruz can get little for export except what is produced on the lines of the railroads between it and Mexico and their branches, the mileage of which is not great, and largely in an unproductive country. On the other hand, Tampico is the outlet of the whole large system of the Mexican Central and of such of its connections as through it can best reach a seaport. They are not doing much for its export trade yet, however, the whole of it being less last year than 57 tons per mile of that railroad. The exports through El Paso are a fifth larger than those from Tampico, but their value is 40 per cent. less, averaging $72 per ton at El Paso and $155 at Tampico.

All these figures (except the values) are so small that in so large a country it would not be surprising to see them doubled, trebled or quadrupled in a few years. Mexico moves slowly, however.

Annual Reports.

Michigan Central.—The annual report of this company for the year ending Dec. 31 was issued last week. During the first half of the year the traffic was light, but, as with the Lake Shore, the volume of business in the second six months was large enough to overcome the loss up to July 1, so that the year closes with a gain of $38,000 in freight revenue. This, however, was not enough to overcome the loss in passenger receipts ($187,000), even with the gain of $31,000 in mail receipts. The gross earnings for the year thus show a decrease of $124,375 (less than one per cent.). Operating charges and taxes were reduced $142,840, so that net earnings figure out $18,400 above the 1896 totals. The revenue accounts of the Michigan Central, as will be seen by the table below, show only slight changes in any of the last three years. The differences between the 1897 and 1896 accounts are less than one per cent., and the 1897 gross revenue is only $48,000 below the 1895 figures, while the net earnings last year were within $20,500 of the 1895 total. The general results for the years named follow:

	1897.	1896.	1895.
Gross earnings	$13,697,239	$13,821,614	$13,651,420
Oper. exp. and taxes	10,249,510	10,392,349	10,183,231
Net earnings	$3,447,728	$3,429,264	$3,468,189
Fixed charges	2,415,023	2,394,565	2,402,201
Balance	$1,032,705	$1,034,694	$1,065,958
Due Canada Southern	282,402	296,414	304.715
Net revenue	$750,303	$738,225	$761,272
Other income	44,922	39,685	49,077
Total income	$794,922	$777,910	$810,350
Dividends (4 p. c.)	749,520	749,520	749,520
Surplus	$45,402	$28,390	$60,830

The net decrease in 1897 expenses of $142,840 shown above is accounted for by savings of $101,439 in equipment maintenance, and of $129,803 in cost of transportation, or $231,242 in these two items, while the increased cost of maintenance of way, taxes and general expenses was only $88,401, nearly all in maintenance of way, which increased $74,667 over 1896. The largest item of saving in conducting transportation account was in car mileage, $75,613.

Examination of the equipment account shows that $109,468 has saved in repair work; of this sum $51,522 is to be assigned to passenger equipment, $14,200 to freight cars and $43,846 to locomotive repairs. The locomotive statement gives the average engine mileage as 33,047 miles, and the cost per mile run as 15.88 cents, divided as follows:

	Cents.
Repairs	2.89
Service	6.19
Fuel	6.58
Oil and waste	0.22
Total	15.88

The tons moved in 1897 were 7,627,176, showing an increase of 350,900 tons, while the ton-miles were 1,533,606 thousands, a gain of 53,354 thousands. The passenger statistics show a decrease of 108,000 passengers carried, and of 1,912 thousands in passenger miles moved. The ton-mile rate was 6.16 mills in 1897, against 6.36 mills in 1896 and 6.17 mills in 1895. The through ton-mile rate in 1897 was 4.66 mills, and the local rate 7.29 mills.

During the year Michigan Central Terminal Railroad first mortgage bonds, amounting to $650,000, were sold to provide funds for terminals at Chicago and East Chicago. This was the only increase in the funded debt in 1897, but in January of this year $75,000 additional of these bonds were sold to provide funds for the same work, for which $24,000 has also been advanced from current funds. The construction account has been increased by the total of these amounts $749,022. These are the only important changes in the capital account.

Emotional Wall Street has as rosy opinions of the values of railroad stocks and bonds because American ships have been victorious in battle thousands of miles from the shores of the United States as it was previously despondent. It was perhaps natural, certainly it was inevitable, that severe declines should occur in security values in face of a war. But the war after all is not a much more serious test of the resources of the country than either of the campaigns which England has been carrying on without the slightest disturbance of her finances. After the Maine explosion, Feb. 15, apprehension filled men's minds, and the fall in American securities has been almost continuous, and in many stocks and bonds severe. The loss in the market value of securities and through the delay in financial plans and the stop of many business enterprises and the double interest rates which have been paid by business men borrowing from the banks has probably been much more than the direct cost of the war. But the victory at Manila has changed apprehension into confidence. Most of the conservative railroad shares and bonds are now quoted about as high as before prices went tumbling three months ago, and there has been buying by the public on a large scale. An evidence of this is the buying and selling in the highest class railroad bonds, favored by careful investors, few of which have been dealt in for months. Underlying issues of the Erie, St. Louis & San Francisco, Ohio & Mississippi, Chicago, Milwaukee & St. Paul, Louisville & Nashville, and others, which have been practically without a market since February, and choice bonds like Morris & Essex first sevens, Montana Central first sixes, which have been without quotations for three months and longer, have been more or less extensively dealt in. There has, of course, been a more marked and general recovery in prices in those issues most extensively dealt in than in the high-priced issues. Comparing the prices recorded on the Friday before the Manila victory and those of Tuesday of this week, Atchison adjustment fours are found to have advanced 4⅝ points to 62⅝; Atchison general fours, 4 points to 90; Reading fours, 4⅞ points to 83; St. Louis & San Francisco fours, 4 points to 74; Wabash second fives, 5½ points to 81½; Erie prior fours, 4⅞ points to 89⅞, and Erie general lien 3-4s, 4½ points to 71½; Northern Pacific prior lien fours are 3⅛ points higher, at 94⅛; Texas & Pacific seconds, 2¾ points, at 33⅝, and Union Pacific fours are up 2¾ points to 93¼. Government bonds are strong. Comparing the prices on April 29 with those of May 10, the coupon fours of 1907 have regained 3¼ points; the registered fours of 1925 5½, and the coupons 4½ points, both selling at 122½. Early in February the fours of 1925 sold at 128⅛, and the coupon fours of 1907 at 114½.

The Lower House of Congress has passed the bill, which has been before it a long time and has before been favorably acted upon by both Houses, providing for the arbitration of disputes between railroads and their employees. The bill applies to all railroads subject to the act to regulate commerce, and provides that the Chairman of the Interstate Commerce Commission and the Commissioner of Labor shall investigate, on application, any serious controversy concerning wages, hours of labor or conditions of employment. If they cannot settle it, three arbitrators are to be appointed. The bill has all the weaknesses of previous propositions of the kind, and it is difficult to see wherein it can be of any material benefit, either to employers or employees. Moreover, the constitutionality of a Federal law touching a measure so obviously a police regulation is doubtful. Federal soldiers did, indeed, take a hand in the settlement of the Chicago troubles of 1894, but only because the State and municipal officers failed in their duty to preserve the peace. In labor disputes one party—the employees—is generally financially irresponsible, and an arbitration law depending for its efficacy on an order requiring the defeated contestant to abide by the arbitrators' decision for a certain number of months is at best only a moral instrumentality. It does good only to the extent that it induces, by delay or otherwise, the exercise of reason by men who otherwise would be unreasonable. The enforcement of such a law is entirely out of the question, except by provisions far more elaborate than any that have been suggested in Congress, or that would be accepted by labor leaders—or, probably, by any free people.

Mr. Worthington C. Ford has been removed from the office of Chief of the Bureau of Statistics of the United States Treasury to make way for a political appointment. The change is a real misfortune. Mr. Ford has reorganized the bureau, and has made its statistics not merely trustworthy and comprehensive, but comprehensible and available to the average man. They have become of human use, because, first, they are so complete and accurate that we can make comparisons without the risk of comparing the incomparable; and, second, they are so digested and arranged that we can find what we want without spending on them more time and labor than the result is worth—a very common defect of a great deal of the work of professional statisticians. We may hope that at least the staff and organization will be so little changed that the bureau will still be useful, but, if so, that will be in spite of the blunder of the Administration. This incident reminds us that we are now at war with a nation which has carried the practice of a "civil service without starch" beyond the wildest dreams of Black or Platt or any gentleman in the national Administration. In the art of disrupting the work of the nation for the sake of plunder or politics or your nephew the Spaniards have the advantage of many generations of assiduous practice; and the results have been beautifully shown in Weyler's break-down and in the affair in Manila harbor Sunday before last.

NEW PUBLICATIONS.

Mechanical Draft. By the B. F. Sturtevant Co.; 10 in. x 7 in., 285 pages and 107 illustrations.

The B. F. Sturtevant Company of Boston has issued this practical treatise with the intention of covering the entire subject of mechanical draft. As stated in the preface, the object of the publication is twofold: First, to instruct by a lucid discussion of the entire subject, with such supplementary information as may be necessary to show the superiority of mechanical draft. Second, to show the special adaptability of the Sturtevant fans for this purpose, and to indicate in some degree the extent to which they have already been applied. While it is probably intended principally to fulfill the second object mentioned, yet the general discussion of the subject is entirely independent of the descriptions of the Sturtevant machinery. Among the subjects considered in detail are water, steam, combustion, efficiency of fuels, efficiency of steam boilers and draft.

In Chapter XI. is summed up the advantages of mechanical draft in which the adaptability, flexibility and probability are discussed. After following the arguments here presented, particularly regarding the efficiency, the reader is strongly impressed with the actual saving effected by adopting mechanical draft in plants of any considerable size. The last two chapters, which occupy nearly a third of the book, are taken up with descriptions of the Sturtevant machinery and of the installation of the fans in many large works in this country and a few abroad. The records of the economy effected in some of the cases cited is well worth the careful consideration of those who contemplate the installation arguments here presented, particularly regard- of mechanical draft. We are safe in saying that this book stands alone in its excellency of treatment of this important subject, and its editor, Mr. Walter B. Snow, of the engineering staff of the B. F. Sturtevant Co., deserves great credit for the work he has here done for engineers.

The General Manager's Story. Old-Time Reminiscences of Railroading in the United States. By Herbert Elliott Hamblen, Author of "On Many Seas." New York: The MacMillan Company, 1898. Octavo, 312 pp; illustrated.

Most of us, when we read "On Many Seas," thought that we were reading the true story of the life of an old-fashioned Yankee sailor—touched up a little, perhaps, but in the main a chronicle of actual experiences. Mr. Hamblen's railroad story has the same qualities—the familiarity with the details of the daily life and with the feelings, the motives and the conduct of the men of whom he writes. We are conscious that it is extraordinary that so many things should have happened to one man, but we recognize that they might have happened; the possibilities are all there. This General Manager's story may not always have Max O'Rell's first kind of truth, the truth that is true; but it never fails in the second kind, the truth that might be true. The General Manager goes through the whole range of experience as a freight brakeman, a wiper, a fireman, an engineman, a tramp, a superintendent and a general manager. He is in wrecks and strikes. He "dances on the carpet" and gets suspended and discharged, and goes to jail and gets promoted. He tells us about it all with simplicity and an air of alluring candor. Some of his yarns are tough, as for example, when he ran an engine 30 miles with flat spots half a foot long on the drivers and brought her in without smoke-stack, pilot, whistle or head light, and with the cab shaken to pieces. Still, he is so circumstantial and so delightfully frank that we would rather believe him than not. What an ornament he would have been to the "Ananias Corner" over which the lamented Lander used to preside with such ability!

TRADE CATALOGUES.

The Diesler Motor.—The Diesler Motor Co. of America, with offices at 11 Broadway, New York City, has issued a small catalogue in which is shown by very excellent engravings two Diesler motors, one of 20 H. P. and the other of 150 H. P. The pages are occupied principally with a consideration of the efficiency, economy and availability of the Diesler

motor. It appears from the statement made in the latter part of the pamphlet that this motor is being developed for various uses by a number of large firms in Europe, and the American firm which has taken up the work in this country is building the motors for stationary purposes from 20 to 60 H. P. In our issue of Jan. 28 last, page 54, Prof. Sidney A. Reeve showed theoretical indicator cards of the Diesel, Lenoir, Otto and Combustion-under-constant-pressure engines. From the considerations there given, and from facts subsequently made known, it is probable that the Diesler motor will find a field of usefulness in this country and show a greater economy than many of the motors made in America.

The Walker Company has recently issued additional circulars illustrating and describing new designs in switchboards for lighting plants, switchboards for railroad work, the Walker underground conduit construction for electric roads, and the Walker pivotal trolley with Grover trolley head. The underground trolley and the new pivotal trolley, which are described in the last two mentioned circulars, are referred to elsewhere in this issue.

The Aetna Powder Co., of Chicago, has issued a small catalogue descriptive of Aetna dynamite. In the first part the advantages of this explosive, together with directions for its use, are given in some detail, and those using explosives will find many valuable suggestions as to the safe handling of powder in its many forms. The catalogue is carefully illustrated.

Passenger Platforms.—The Standard Coupler Co., New York and Chicago, has issued a pamphlet describing the Standard steel platform, what it is and how to apply it. There are good illustrations of the structure with sufficient description, making the pamphlet useful to anybody who has occasion to study this very important subject.

Foreign Railroad Notes.

A play recently produced in Vienna is the work of an official (Karlweiss) of the Austria Southern Railroad, and a Vienna paper discussing it remarks that the three best humorous writers of the city are also railroad men. It is suggested that one of the great American humorists is also a railroad man.

There is at present a sharp competition for the traffic on the lower Danube by the steamship lines of three different countries, Austria, Roumania and Russia. Several new lines have been established, among them one between Galatz (about 100 miles from the mouth of the Danube) and Constantinople, and one between Galatz and Batum, at the east end of the Black Sea.

The restaurant privileges in the Union Station at Munich have been held for many years by a tenant who paid $3,000 a year for the privilege. The time for reletting it came this spring, and it brought $12,500 per year. It is a condition of these re-lettings that the old tenant can hold the place if he will pay as much as the highest bidder, but in this case he would not have it on those terms.

A cog-wheel railroad is not expected to carry much freight, and is especially unlikely to have much down freight. But one in Austria has been very busy carrying ice recently. The winter was so mild that the ice crop failed where it is usually gathered; but this railroad runs up to Lake Csorba, 4,500 ft. above the sea, and in this lake the ice was thick and solid. It has been shipped to distances heretofore unknown in that country—to Vienna, to Austrian Silesia and to Eastern Prussia.

On the Russian New Year's Day, Jan. 13, the Siberian Railroad was opened for "temporary" traffic from Kansk to Klutshi, which latter station is within about 100 miles of the south end of Lake Baikal. As far as Krassnojarsk this railroad is now open for regular traffic and through shipments, but the general Russian through tariff applies only as far as Ob, which is some 1,700 miles from the western terminus. Further east local rates are charged. To Ob there are 7 to 10 trains daily, it is reported.

The number of trips made by suburban passengers on all the railroads leading out of Berlin was 44¾ millions in 1895-96, against 23⅝ millions in 1890-91, which was the last year before the introduction of the present low rate. Under the present tariff the numbers of trips have been (year to March 31) in millions:

1892.	1893.	1894.	1895.	1896.
30.7	34.6	38.0	41.0	44.8

The average receipts per journey under the old tariff were 6.64 cents; under the new, 4.7 cents. The gross earnings from this traffic in the last year were 35 per cent. more than in the last year of the old tariff. This may not more than pay the cost of the addition of 91 per cent. to the traffic, and may not equal it; but the change was not made to increase profits.

TECHNICAL.

Manufacturing and Business.

Simplex body and truck bolsters are specified on 75 of the cars recently ordered by the Delaware & Hudson Canal Co. from the Jackson & Woodin Mfg. Co., American body and truck bolsters being specified on the balance.

The Whitin Machine Co., of Whitinsville, Mass., has just completed a new casting shop, which will be entirely fireproof. It was furnished by the Berlin Iron Bridge Co., of East Berlin, Conn.

The McCord journal box and lid are to be used on 200 cars which the Chicago, Rock Island & Pacific is about to build.

The Columbia Stoker Co., of Holyoke, Mass., has been incorporated with a capital of $100,000. The officers are J. W. Cumnock, President, and J. C. Keough, Treasurer.

The Willmar Gasoline Engine Co. has been incorporated at Minneapolis, Minn., with a capital stock of $20,000. The company will build a plant at Willmar.

The Morgan Engineering Co., Alliance, O., has advanced the wages of its employees 15 per cent.

New Stations and Shops.

The Pennsylvania has taken out a permit for the new ferry house which it is to build at the foot of Market street, Philadelphia.

A large brick freight house will be erected at Oshkosh by the Chicago & Northwestern, and an addition will be added to the round-house.

Iron and Steel.

The Government of Ecuador is asking bids for an iron building to be used as a custom house at the port of Guayaquil. Plans and specifications are in the hands of Miguel Valverde, Consul General of Ecuador, 24 State St., New York City.

The Tyler Tube & Pipe Co. has received an order from the United States Government for 2,000 boiler tubes for the cruiser Alabama now being built.

The Delaware Iron Works, Newcastle, Pa., after an idleness of nearly a year, will resume operations at once.

The Bethlehem Iron Co. has received a contract from the Government for 35 5-in. rapid-firing guns.

Interlocking.

The Illinois Central R. R. will erect an interlocking plant of 18 working levers at the crossing of the Peoria, Decatur & Evansville at Mattoon, Ill.

Proposed Rates of Elevated Cars on Brooklyn Bridge.

Commissioner Shea, of the Department of Bridges, had a conference on Tuesday of this week with the representatives of the elevated railroad companies of Brooklyn, which are to use the Brooklyn Bridge under contracts obtained from the old Board of Bridge Trustees. At the close of the conference Mr. Shea made the following statement of the terms he had demanded from the railroads:

If the bridge railroad is run in connection with the elevated railroad, then the elevated roads must pay 45 cents for each of 1,600 cars per day, as a minimum, or, per annum	$262,800.00
For rentals of terminals, repairs, &c	12,153.44
Total	$274,953.44
If the bridge railroad and cars are leased to the elevated roads, then the elevated roads must pay for each of 2,500 cars per day, as a minimum, 10 cents per car, or, per annum	$91,250.00
Rent of terminals, storage, &c	20,306.28
Total	$111,556.28

The repairs of the elevated railroad structure and terminals to be made at the expense of the elevated railroads, by and under the supervision of the Bridge Commissioner and persons designated by him. In either case the elevated railroads must pay the gross sum mentioned. If a greater number of cars than designated in either case cross the bridge, the stipulated sum must be paid for each car in excess of such numbers. The elevated railroad must transfer passengers from terminal to terminal for a fare not in excess of that charged by the bridge railroad.

Erecting Bridges.

The March issue of the Journal of the Association of Engineering Societies has a paper by Mr. Frank P. McKibben with a brief discussion by various members on the subject of erecting metallic bridges. Mr. McKibben reviews the art and practice of this important engineering specialty at some length, and gives many interesting pictures. We judge that the paper was prepared as an illustrated lecture. The engravings show some good examples of bold, or rapid, or otherwise remarkable work. One of the most extraordinary of these was the erecting of the 523 ft. span of the Ohio Connecting bridge at Pittsburgh on falsework resting on pontoons and floating it into place, which work was described in the Railroad Gazette in 1890. Here about 1,000 tons of metal was assembled, the bottom chord, 75 ft., and the top chord, 140 ft., above the water level, towed into position and dropped on to the bridge seats. It was one of those bold and brilliant deeds which are not lacking in the annals of American engineering.

Some of Our Ordnance Works.

The mechancial engineer and the machinist have come to be as important in war as the soldier and sailor. Furnaces, foundries, machine tools, the skill to use them and the organization of these means and skill must stand ready behind the armies and fleets or the armies and fleets might better be armed with bows and arrows and cutlasses. A little notion of our war resources in machinery and the skill to use it can be got from the American Machinist of May 8, which gives up 20 pages to pictures of some of our shops now engaged in making ordnance material. The views (photographs) show the Builders' Iron Foundry, rifled mortars; Watervliet Arsenal, several views of finishing and handling guns; Navy Gun Shops, several views of drops and processes, guns and gun carriages; Niles Tool Works, disappearing carriage for 10-in. gun, making rifled mortars, Pond Machine Tool Co., disappearing carriages for 8-in. and 10-in. guns; Bethlehem Iron Works, many views of the works, tools and processes of making guns and armor.

Effects of Electrifying a Horse Line.

During the entire month of March, 1898, the Fourth avenue street car line of the Metropolitan Street Railway Company was worked by electricity (underground conduit) through to the New York end of the Brooklyn Bridge. The figures of traffic on that line for that month, as compared with the figures for March, 1897, when the line was worked by horses, show a remarkable increase. In March, 1897, the number of passengers carried amounted to 1,740,208; in last March the number had increased to 3,421,169, or it had almost doubled. This, it must be remembered, was without any reduction of fare, but simply because of improvement in speed, comfort and facilities.

Snow Plow Motors.

Two Westinghouse 12-A 25-horse power motors were placed on the heavy Taunton snow plows of the Milford, Holliston & Springfield (Mass.) Railway early in the winter. The superintendent of the railway, Mr. G. B. Larrabee, reports that during a very severe winter, in which the heaviest storms were encountered that have occurred for several years, the motors never caused a stoppage or burnt out. During the heaviest storm the motors were only normally warm. These motors were of the ordinary standard Westinghouse type, and considering the severe service, they have made a good showing.

Boiler Tests.

Prof. L. P. Breckenridge, of the University of Illinois, is now making the first of a series of boiler tests in the Illinois Central round house, Urbana, Ill., with locomotive No. 420, which tests we referred to in our issue of March 18. The object of these tests is to determine how the efficiency of locomotive boilers is affected by scale and incrustation on the tubes and firebox sheets. Mr. William Renshaw, Superintendent of Machinery of the Illinois Central, has placed at the disposal of the University authorities the facilities for making a very complete investigation.

Interchange Prices on the Far Western Roads.

At the last meeting of the Master Car Builders' Association, one of the liveliest discussions was as to making special prices on interchange parts and work for the far western roads. It is apparent that this subject is destined to come up again this year, as a strong committee has sent out a circular asking for information as below. The committee consists of Messrs. McConnell, Bush, Charpiot, Purvis and Hennessey.

The undersigned desire to procure the following information in connection with the matter of special prices for the roads west of the 105th meridian:

1. What is the average pay of your freight car repairers and carpenters?
2. Refer to M. C. B. prices, in effect Sept. 1, 1897 (pages 22, 23 and 24), and state the cost to your company of the material enumerated therein.
3. In connection with the foregoing, give the value per gross ton of the scrap in each case.
4. What, in your opinion, would be an equitable percentage to be added to the M. C. B. prices for repairs made west of the 105th meridian?
5. Should this percentage be added to material and labor, or to material only?
6. Would you have this percentage apply to private line cars only where there is no reciprocity, or would you have it apply to all cars?
7. What is the annual freight car mileage made by your freight cars on foreign lines?
8. What is the annual freight car mileage made on your road by foreign cars?
9. Please state amount paid annually to foreign lines for car mileage, and the amount collected from foreign lines for mileage made by your cars.
10. What do you pay annually to foreign lines for repairs to your cars?
11. What do you collect annually from foreign lines for repairs made by your company to foreign cars?
12. What changes would you recommend in the present M. C. B. prices?

Members are requested to send replies, not later than May 23, to the chairman, J. H. McConnell, Sup't Motive Power and Machinery, Union Pacific Railroad Company, Omaha, Neb.

Injector Suit.

The Hancock Inspirator Co., of Boston., Mass., has brought suit in the Circuit Court of the United States for the District of Massachusetts against the Penberthy Injector Co., Detroit, Mich., claiming that the Penberthy injector is an infringement on the Loftus patent No. 300,092. A suit has also been brought against the Welcome injector.

THE SCRAP HEAP.

Notes.

The Railroad Commissioners of New York have exempted all railroads for the years 1897 and 1898 from the provision of the air brake law requiring them to equip 10 per cent. of their freight cars each year.

The Louisiana Constitutional Convention has finished its labors and adjourned. The Railroad Commission to be established under the constitution will

be elected by the people. New railroads are to be exempt from taxation for 10 years.

Sir Wilfrid Laurier, Premier of Canada, announces that the difficulties in connection with the proposed fast steamship line between Canada and England have been so far overcome that the contractors, Peterson & Tait, will begin work on the vessels in July.

The Union Pacific has sent invitations to all of the local newspaper editors along its lines to visit Omaha at any time before June 1 in order to post themselves regarding the Trans-Mississippi Exposition. Each editor's pass will be made good for himself and his wife.

The Denver Post says that the Union Pacific is to maintain a surgical department, with hospitals, at Omaha, Kansas City, Denver and Rock Springs. It would appear that this department is to be kept up about the same as it was in former years, when it was supported chiefly by contributions from the employees, but the expense is to be borne wholly by the railroad company.

The Illinois Central Railroad Company has presented to Col. H. G. Hester, Secretary of the New Orleans Cotton Exchange, a bale of cotton, done up in white duck and bound with brass bands. The bale is now on exhibition in the Exchange, and the gift is to mark the completion of the delivery by the Illinois Central at New Orleans of one million bales of cotton in the eight months from Sept. 1 to May 1; the bale is numbered 1,000,001. This is said to be the largest number of bales of cotton ever delivered in one city by one transportation company during a single season. President Stuyvesant Fish, in a letter accompanying the bale, thanks the Exchange for its co-operation in securing the grant from the city of important franchises facilitating the delivery of freight by the road in the city.

Sleeping Car Terms.

General Manager J. C. Yager, of the Wagner Palace Car Company, has issued the following instructions:

"Rooms having three berths will be termed drawing-rooms; rooms having two berths and rooms now known as compartments will be termed staterooms; cars heretofore termed drawing-room cars will be termed parlor cars, and rooms in these cars will be termed compartments."

Hauling Logs by Cable.

The Bridal Veil Lumbering Co., owning saw and planing mills and extensive tracts of timber land at Bridal Veil, Ore., 28 miles east of Portland, on the line of the Oregon Railroad & Navigation Co., has lately supplanted ox teams in some of its forests by the introduction of powerful donkey engines, which, by means of steel cables, gather logs from a radius of a mile or more. The large logs cut in Oregon are hauled mostly on "skid roads," the skids being laid transversely about every five feet, and well lubricated. With two teams of seven yoke of oxen each 24,000 ft. of logs are hauled over a way of this kind at one trip; but with cables and steam power loads of 30,000 ft., equal to about 60 tons, are moved. The steam engine with two cylinders, 10 in. x 16 in. each, and its winding drums, which latter are 30 in. in diameter and 5 ft. long, are made very strong, and are anchored so as to withstand any strain that is likely to be put upon them. The engine is called a "bull donkey," and has two drums. From the smaller a light cable is pulled out to any desired point, within a mile and a half, passed over a pulley and returned to the engine, where it is attached to the larger cable, ⅞ in. in diameter, which is on the larger drum, and the large cable is then pulled to the distant point. The engine is located at the head of a chute leading to the saw mill, and into this the logs are delivered by the cable. The movement of the logs through the chute, about 3,700 ft., is also effected by cable, which works precisely like a street car cable. One "bull donkey" has been located at a point where it is expected to gather 50,000,000 feet of logs without being moved.

The Bridal Veil is the company that hauls logs over a railroad without cars. A narrow gage railroad, built in the manner common in logging forests, is fitted with heavy guard timbers at the sides and has the ties suitably lubricated, so that the track affords not only a road for the locomotive, but a chute, which makes a slide for the logs. Most of the logs are 4 ft. or more in diameter, and, being coupled together, they are hauled in trains like so many sleds.

Notes on British Tramways.

Edinburgh.—The Edinburgh Corporation has for some time been considering the question of equipping its tram lines for mechanical traction, and has now placed a contract with Messrs. Dick, Kerr & Co. for their equipment with cable traction. The total cost of the work is about $445,000, and includes the construction of cable tramway junctions, terminal pits, etc. The whole is subject to the approval of Prof. Kennedy. The Leith Corporation has been also considering the cable traction system. Mr. Colam, C. E., who has been advising in regard to the matter, states that the Edinburgh Corporation has caused its cable station to be built for accommodating machinery and supplying power sufficient for operating both the Leith and Edinburgh lines.

Bradford.—The Bradford (Eng.) municipal authority has, like so many other English municipalities, recently sent a deputation to the continent to inquire into the working of combined electric lighting and traction plants in a number of continental cities. The matter is an important one to Bradford, as it already has large electric lighting works, and has resolved upon the equipment of a section of municipal tramways with the overhead trolley.

Neath.—The municipal authority of Neath has entered into an arrangement with the British Gas Traction Co., of London, for the working of the corporation tramways by means of gas power for a term of seven years commencing from July 1, 1898. This lease may be subsequently extended for another seven or 14 years. The company will pay a rental of over $6,500 per annum to the corporation, will equip the line with gas motor cars of improved design and construction, and will provide a continual through service starting from each terminus every 15 minutes. This company, we believe, equips its tramways on the well-known Luhrig gas system, and has quite recently built the Blackpool, St. Annes and Lytham gas lines.

Fresh Fish Traffic on English Railroads.

The sea fisheries of Great Britain and Ireland for the year 1897 form the subject of a special report which has just been made by the British Board of Trade. The principal part of the report gives quantities and values of the principal kinds of fish landed at the principal ports, these statistics being given for each of the 12 months in the year, with data for making comparisons between 1897 and preceding years. Appended to this is a return of the fish carried by the railroads from each of the principal ports, from which one may gain some idea of the enormous amount of this traffic in England. The total for 1897 is 468,130 tons, the quantity having gradually increased from 426,299 tons in 1892. The shipments reported in England and Wales make up about three-fourths of the total. The shipments in Ireland were only 10,894 tons for 1897. Hull, which ships fish by three different railroads, forwarded in 1897 no less than 63,659 tons, equal to an average of 174 tons a day throughout the year. Grimsby, which ships nearly all its fish over one road, the Great Central, shows for last year 89,006 tons, equal to 244 tons daily during the year. Presumably, the most or all of this tonnage is fresh fish, which has to be carried in fast trains.

German Use of Coke in Stationary Steam Plants.

Consul Bouchsein writes from Barmen, March 11: "According to a report on smoke-consuming appliances of a royal Prussian commissioner, none of the systems give perfect smokeless combustion of coal. Coke is therefore extensively used in stationary steam plants where smoke is objectionable. Consumption in this line has increased rapidly in recent years, amounting to 7,900,000 tons in 1894 in Germany, an increase of 11.1 per cent over that for the preceding year.

Petroleum Briquettes in Germany.

Joseph Kohlendorfer of Landshut, Bavaria, has invented a process for making petroleum briquettes. In this process about 10 per cent. of soda lye, with 10 per cent. of fatty matter, is heated in a boiler, and enough petroleum refuse is added to the heated mass to make up 100 parts. This mixture is then heated, under constant stirring, for about an hour, the time varying with the mode and intensity of heating. Attention should be paid to prevent the temperature reaching the boiling point of petroleum, as in this case a large quantity of froth would form. In this incipient state of saponification the mass acquires the property of taking up large quantities of fluid rock oil, and if this incorporation proceeds too slowly or remains incomplete it may be hastened by adding a little soda lye. The mixture is run into molds and allowed to cool, when it may be cut into pieces of any desired form.

Railroad Contract in Gautemala.

Consul-General Beaupre, of Gautemala, reports, under date of April 6, that Messrs. May and Jekyll, citizens of the United States, have contracted to operate the Northern Railroad of Gautemala, receiving from the Government a bonus of $40,000 per month. Mr. J. T. Norton, an American, will be general manager, and most of the employees will be citizens of the United States. The contract was to go into effect April 15.

Electric Railroads in Russia.

Consul Smith writes from Moscow: "The firm of Siemens & Halske has made a proposal to the city council of Moscow to construct six lines of electric tramways in the city and also to take charge of the electric lights, which are now in working order. The concession is to be for a period of 45 years, and the firm is to be paid at certain intervals out of the net earnings,

"Among the various affairs with which the St. Petersburg city council has to deal is the working of the tramways. The city council has received over 10 tenders for electric trams from companies in France, Belgium, etc. The city has had a contract with the company now in charge by which the city received 4 per cent. of the profits and a certain amount of taxes on the horses used."

Decision by Interstate Commerce Commission in New York Differential Complaint.

The Interstate Commerce Commission, in an opinion by Commissioner Prouty, has announced its decision in the case of the New York Produce Exchange vs. the Baltimore & Ohio and other railroads from the West to the Eastern seaboard. The complaint, brought on behalf of New York City, alleged that differentials allowed by these carriers in rates on grain, flour and provisions from Chicago and other Western points of 2 cents to Philadelphia and 3 cents to Baltimore below the rate to New York were unlawful under section 3 of the Interstate Commerce Act.

The Commission rules that its jurisdiction is confined to inquiring whether the situation which the carriers have created is in violation of the act, and that preferring one locality over another does not violate the third section unless the preference is undue or unreasonable; any preference which is without legitimate excuse is, in itself, undue and unreasonable. Railroad competition may, but it does not necessarily, justify a preference to a particular locality or commodity, and therefore, though discrimination against one locality based upon such competition may be excusable in theory, the question remains whether it is undue or unreasonable, and that question is one of fact in each case.

The Commission also holds that, while carriers may lawfully disregard distance under some circumstances, no previous decision is authority for a ruling that a carrier may be compelled to disregard distance for the purpose of placing two communities upon a commercial equality.

In stating its decision, the Commission says that, while there is much in the case to induce a different conclusion, and while it has arrived at such conclusion with a good deal of hesitation, it does not think that upon the present record the carriers have exceeded the limit within which they are free to determine for themselves. While there is much to indicate that the differentials should perhaps be somewhat modified, it cannot be affirmed with certainty that they are wrong. Considering the effect as exhibited through a long series of years, it is impossible to say that they have exercised any untoward or unnatural influence upon traffic. The opinion concludes as follows:

"If the diversion of export grain from the port of New York which is shown to have taken place in 1896 should continue in subsequent years, and it should appear with reasonable certainty that the published rates had been maintained to all the ports, the actual effect of these differentials upon the movement of grain could be determined with confidence, and a different question would be presented, which might merit further consideration, and of which the disposition of the present case would not be controlling." The complaint is dismissed without prejudice.

Preservation of Boilers.

A method of preserving boilers not in use has been prescribed for the French navy. According to this the boilers are completely filled with fresh water, and in the case of large boilers with large tubes there is added to the water a certain amount of milk of lime or a solution of soda; in the case of tubular boilers with small tubes, milk of lime or soda is added, the solution, however, not being so strong as for the larger tubes, in order to avoid any danger of contracting the effective area by deposit from the solution. The strength of the solution is to be just sufficient to neutralize any acidity of the water. Care is enjoined to be taken to preserve the outside of the steel or iron tubes in those boilers which are not to be used for long periods; such are for this purpose painted with red lead or coal tar as far as it is possible to reach, while for those portions which are inaccessible a protective coating is obtained by burning under the tubes a certain amount of tar or coal tar, the smoke of these forming a coating of soot, which prevents the air from reaching the surface of the tubes. Besides this treatment the boiler casing is closed and kept air-tight, after some quicklime has been placed inside. Periodical inspections of these boilers are made to insure the complete filling of the tubes.—Engineer.

Chicago Grain Cargoes.

The steel schooner Australia, which is 48 ft. wide and over 400 ft. long, was towed up the North Branch of the Chicago River to the Armour elevator at Division street and the Ogden Canal last week, and loaded with a cargo of 65,000 bu. of wheat, and was towed down the river safely, drawing 8 ft. of water. It is thought that a cargo of 140,000 bu., with which the schooner would draw 12 ft., would be the largest that could be safely handled with the present depth of water in the river.

The steamer Andrew Carnegie carried 230,000 bu., or 6,440 tons, of corn last week from South Chicago to Owen Sound, and even with this cargo she was not loaded to her full capacity, owing to the fear of new reefs in the Straits or in Georgian Bay. This cargo breaks all records, the largest cargo heretofore being 226,000 bu. of corn, carried by the Australia at the opening of navigation. The great depth of water at South Chicago and at Owen Sound makes it possible for the big boats to safely handle such cargoes.

The Nile Dams.

Further advices state that the surveys for the location of the two proposed great dams of the Nile have been completed. Sir Benjamin Baker, as before stated, is the chief engineer, resident in England. Sir William Garsten will be the Chief Engineer in Egypt. The contractor despatched from England last month a vessel of 1,000 tons loaded with machinery to begin the work of construction.

The dam at Assuan was described in the Railroad Gazette of April 8. That at Assiut will be of similar construction, but built of brick instead of stone, like the Barrage of the Delta.

A Bridge Over the Mersey.

The ancient proposition to build a bridge across the Mersey from Liverpool to Birkenhead has been lately revived in a paper before the Liverpool Chamber of Commerce by Mr. J. T. Webster, C. E. The people of Liverpool seem to think that something should be done to facilitate freight traffic across the river. Passenger traffic is pretty well provided for by the Mersey Tunnel, which has been in operation for 12 years or more. The highest point of the roadway above sea level would be 150 ft. and the longest span 2,000 ft., and the side spans each 1,000 ft. The towers would rise to about 400 ft. above sea level. The grade on the Liverpool approach would be 1 in 35.6 and on the Birkenhead approach 1 in 34.3. The capital outlay, including interest, during building is estimated at about 13½ million dollars.

Steamers for the Manchester Ship Canal.

The project of building a fleet of cargo steamers for direct trade between Manchester and the United States is said to be proceeding favorably. A total capital of £600,000 will be required, and a prospectus will shortly be issued inviting applications for debentures to the amount of £250,000. Subscriptions to the share capital of £350,000 are said to be guaranteed. It is proposed to build five or more steamers to carry from 8,500 to 10,000 tons of cargo and 800 head of cattle, with a speed of 12 knots.

A Proposed Bridge in Denmark.

It is reported that a bridge is to be built across the Little Belt connecting the island of Funen with the continental part of Denmark; or, rather, that there is a bill before the Danish Legislature to authorize such a construction. This bridge would be 4,500 ft. long; it is proposed that the clearance under the bridge shall be 180 ft. above high water, the spans to be 1,000 ft. long, supported on iron columns. The estimated cost is $3,250,000.

New Trains on the Chicago, Rock Island & Pacific.

The Chicago, Rock Island & Pacific placed the four new through trains lately built by the Pullman Company in regular service between Chicago and Denver on Sunday, May 8. According to the regular schedule, the west-bound trains will leave Chicago daily at 4:30 p. m., and arrive at Denver the next day at 8 p. m., thus making the distance, 1,083 miles, in 28 hours and 30 minutes, which is the same time as that of the Burlington and the Northwestern fast trains. The east-bound trains will leave Denver at 9.30 a. m., and arrive in Chicago at 2.15 p. m. the following day. The new trains will each consist of a composite car, a chair car, two sleeping-cars and a dining-car. On Thursday, May 5, one of these trains was taken west on a trial trip carrying officers of the road and a party of guests. This special left Chicago at 2:30 p. m. and arrived in Denver at 1:30 p. m.

the next day, making the run in 24 hours, though it was delayed near Rock Island nearly an hour by the locomotive breaking down.

Politics and Transportation in Paris.

The Paris city authorities insist that their proposed rapid transit railroad shall not be made capable of serving for suburban traffic. It was first proposed to make the new lines of less than the standard gage, but the engineers insisting that they needed the width, the authorities compromised on making bridges and tunnels too small to admit the ordinary cars and locomotives. The motive for thus crippling the efficiency of the new lines is said to be the desire to prevent the growth of the suburbs. The city gets an income through taxes on food and drink, etc., averaging $24 per head of the population within its limits, and nothing from suburban residents. This seems very much like "steeple politics" to people outside of France.

This is Probably Called Patriotism.

The French Chamber of Deputies having voted to substitute "West European" (Greenwich) time for Paris time, which has heretofore been the standard of all France, while all French maps and charts are drawn with the Paris meridian, the matter was brought before the French Academy of Sciences by a member who thought the national pride would suffer by such a change. Another member suggested that to save the national pride an observatory should be established at Argentan, in Normandy, 9° 21′ west of Paris, which happens to be exactly on the meridian of Greenwich, and that be made the standard meridian of France! The proposal to adopt West European time, which was accepted by the Deputies, still requires the approval of the French Senate.

Punctuality on the Boston & Providence.

Superintendent McAlpine of the Providence division of the New York, New Haven & Hartford has issued a statement showing that for the week ending May 6, out of 1,846 passenger trains run on the division, 99.62 per cent. were on time, or within five minutes of it, and that on three days every train was on time. The statement of causes of delays shows: May 2: No. 101, 6 minutes; freight train stalled at Spring street. No. 511, 9 minutes; Train 343 waiting at Boston for passengers. No. 343 made up its time before finishing run. No. 244, 32 minutes; freight breaking down. May 4: No. 164, 12 minutes; connections 10, signals at Mansfield 2. May 5: No. 87, 14 minutes; killed a man at Mansfield. No. 33, 8 minutes; engine bearings heated. May 6: No. 47, 6 minutes; delayed by freight train at Walnut Hill, and at Dedham by construction work. Out of 1,846 trains run during the week, onlly seven delays of over five minutes occurred. These aggregated 87 minutes, or an average of 2.8 seconds per train. Records have been kept for some years, but this is the best showing yet made. The circular tenders the thanks of the management to all concerned, and urges a continuance of the good work with a view to showing a week without a delay.

A Fine Gift.

Mr. Frederick H. Stevens, President of the Brooks Locomotive Works, has presented the Horatio G. Brooks Homestead in Dunkirk, valued at $150,000, to the Young Men's Association, to be used as a hospital, free library and clubhouse.

LOCOMOTIVE BUILDING.

The Richmond Locomotive Works are building two engines for the Chicago & Northwestern.

It is reported that the St. Louis, Peoria & Northern will shortly buy a number of new locomotives.

The Brooks Locomotive Works are building two locomotives for the Duluth, Missabe & Northern.

The Atlantic Coast Line has ordered six 10-wheel locomotives from the Baldwin Locomotive Works.

The New York & Ottawa has ordered two 10-wheel locomotives from the Baldwin Locomotive Works.

The Baldwin Locomotive Works are building one consolidation locomotive for the Atlantic Mining Co.

The Richmond, Fredericksburg & Potomac is having one engine built by the Richmond Locomotive Works.

The Dickson Locomotive Works have about finished building two new locomotives for the Honduras Railroad.

We are officially informed that the Texas & Pacific is figuring on buying 10 or 12 new locomotives. No contract has yet been let.

The Brooks Locomotive Works have received an order to build one narrow-gage mogul engine, with 15 x 18-in. cylinders, for the Tionesta Railroad.

The Guayaquil & Quito Railroad of Equador, which intends to build 325 miles of road (narrow gage), will buy 28 locomotives. Edward Morley, New York City, is Secretary.

We are officially informed that while the St. Paul & Duluth is considering buying additional motive power and hopes to do so soon, the matter is being held in abeyance for the present.

The American Railroad & Lumber Co., of El Oro, Mex., has placed an order with the Brooks Locomotive Works for two narrow-gage consolidation engines with 17 x 20-in. cylinders.

The Choctaw, Oklahoma & Gulf has ordered a steam inspection car from the Baldwin Locomotive Works. This road will probably order some locomotives, also, as mentioned in our issue of Apr. 22.

The Lorain Steel Co., of Lorain, O., has placed an order with the Cooke Locomotive Works for one 6-wheel switching engine with 17x24 in. cylinders and with the Pittsburgh Locomotive & Car Works for two 6-wheel switchers with 16x24 in. cylinders.

CAR BUILDING.

The Cleveland, Cincinnati, Chicago & St. Louis is building 50 flat cars in its own shops.

The Duluth, Missabe & Northern has bought three refrigerator cars from the Armour Co.

It is rumored that Swift & Co. are figuring on some combination box and refrigerator cars.

The Union Tank Line is building 25 No. 3 combination tank and box cars at its Buffalo shops.

The Delaware, Susquehanna & Schuylkill is building six hopper-bottom coal cars in its own shops.

The Guayaquil & Quito Railroad of Ecuador, referred to in the Locomotive Building column, will buy 600 freight cars.

We are officially informed that the Grand Trunk has not yet decided to order any new freight cars, as reported last week.

We are reliably, but not officially, informed that the Illinois Central will shortly place an order for 500 box cars of 60,000 lbs. capacity.

We understand that the Columbus, Sandusky & Hocking has placed all or part of the order for 500 cars referred to in our issue of March 4 with the Ohio Falls Car Mfg. Co., of Jeffersonville, Ind.

The Wells & French Co. is building 600 refrigerator cars for the Armour Co., in addition to the 1,200 ordered some time ago. Monarch solid brake beams and McCord journal boxes are specified for these cars.

The Illinois Central order for 500 coal cars of 80,000 lbs. capacity, mentioned in our issues of April 15 and May 6, has been divided between the Mt. Vernon Mfg. Co. and the Wells & French Co., 250 going to each builder.

The Columbus, Hocking Valley & Toledo will buy some new freight cars, but we are officially informed that no application has yet been made to the court for permission to buy the same, and that no definite action has yet been taken.

The two new limited trains on the Chicago, Milwaukee & St. Paul between Chicago, Milwaukee, St. Paul and Minneapolis, which have been mentioned in these columns from time to time, will be put in service May 22. Before that date the trains will be exhibited at Dayton, Columbus, Cincinnati, Indianapolis and Chicago.

The Honduras Railroad has placed an order for 20 flat cars, 3 ft. 6 in. gage, 30,000 lbs. capacity, 32 ft. long, 7 ft. 6 in. wide and to have 24-in. wheels, 4½-in. axles, diamond steel trucks, air brakes, link and pin couplers and Beamless brakes. We understand the contract was given to either Jackson & Sharp or the Bloomsburg Car Co.

The St. Charles Car Co. is building 100 freight cars for the Atlanta & West Point Railroad and the Western Railway of Alabama. They will be of 60,000 lbs. capacity, 40 ft. long inside, 8 ft. 8 in. wide, 7 ft. 10 in. high and equipped with National hollow brake-beams; Westinghouse air brakes, Standard couplers, American continuous draft rigging, Fletcher journal box lids and Scott springs.

The 150 cane cars ordered April 18 by the Miles Planting & Mfg. Co., Ltd., of Louisiana, from the Illinois Car & Equipment Co. are to be built at the Anniston, Ala., shops of the car company, and delivered on or before Sept. 1 next. These cars are to be used for hauling sugar cane. They will be 15 ft. 2 in. long over end sills, 6 ft. wide and 3 ft. 6 in. high, and 10,000 lbs. capacity. The axles will be 2½ in. in diameter at centers, with 2¼ in. x 5 in. journals, with 16 in. wheels. Radial drawbar couplers, radial draft rigging, cast-iron journal boxes and journal box lids, and mineral brown paint will be used.

The Chihuahua & Pacific Railroad on May 6 sent out specifications for 50 box and 30 flat cars. They are to be 34 ft. long and 8 ft. 9 in. wide outside of sills; have American continuous draft rigging, French springs, Westinghouse air brakes, Christie brakeheads and brakeshoes, Lake Shore & Michigan Southern Railroad standard diamond frame trucks, M. C. B. standard journal boxes fitted with Morris pressed steel lids, and Soule's patent dust guards. The box cars will have Chicago roofs, Wagner doors and Acme door hangers and seal locks. Specifications will shortly be sent out for bids on 8 cars for passenger service.

The 1,000 box cars of 60,000 lbs. capacity which the Chicago, Milwaukee & St. Paul is now building at its West Milwaukee shops, at the rate of 15 cars a day, are 33 ft. 8 in. long, 9 ft. 2 in. wide, 8 ft. 3¾ in. high and weigh 30,450 lbs. Iron axles and bolsters, Westinghouse air brakes, Congdon brake shoes, M. C. B. couplers, swing motion trucks, Barr metal brake beams, Barr contracting chilled wheels, Barr patent door fastenings, C., M. & St. P. standard doors, draft rigging and journal box, and Drexel journal box lids, are being used. One-half will have standard double-board roofs, and the other half Chicago iron roofs.

BRIDGE BUILDING.

ALLEGHENY, PA.—Bids have been asked for a steel arch bridge over Wood's Run at Davis Ave., 400 ft. long, 22 ft. roadway, steel buckle plate floor and two 8 ft. sidewalks.

ALMA, KAN.—The Commissioners of Wabaunsee County will build two bridges each about 40 ft. long.

BENWOOD, W. VA.—The Bellaire Bridge Co. is reported incorporated, with a capital stock of $500,000, to build a toll bridge across the Ohio River. Among the directors are Wm. C. Jute, Pittsburgh, Pa.; Chas. Rosser, Bellaire, O.; Jas. Hastings, Allegheny City, Pa.; Wm. C. Caldwell, Wheeling, W. Va.

COLUMBUS, O.—Bids are wanted May 25 by the Commissioners of Franklin county, W. H. Halliday, Auditor, for building three bridges: One over Alum Creek, Columbus, 75 ft. long; one north of Harrisburg, Pleasant Township, 90 ft. long; one in Perry Township.

DAYTON, O.—The bill to authorize the Commissioners of Montgomery County to issue $16,000 in bonds for a new bridge across the Maimi has passed the House.

FREEHOLD, N. J.—The Monmouth County Board of Freeholders, it is stated, will build a bridge across Sunset Lake at Grand Ave., Asbury Park.

FREEPORT, ILL.—It is stated that the Board of Supervisors has recommended appropriations for five new bridges, aggregating $8,000.

HOUSTON, TEX.—It is stated that an iron bridge will be built across Buffalo bayou at Franklin St., to replace a wooden one.

JERSEY CITY, N. J.—The Hudson County Board of Freeholders will build a bridge over the tracks of the Erie at Park Ave., Hoboken, and, it is stated, the plans will be drawn by Mr. Edlow W. Harrison, Fuller Building, Jersey City.

KANKAKEE, ILL.—Press reports state that the Commissioners of Kankakee County will probably build two bridges.

MOUNT VERNON, N. Y.—The Court of Appeals has decided that the N. Y., N. H. & H. must build a bridge across its tracks to connect North and South Third Aves. (Feb. 18, p. 128.)

NEWPORT, IND.—It is stated that a steel bridge will be built across the Wabash River at Perrysville, to cost about $25,000. The citizens of Perrysville voted $12,000 toward the bridge, the balance to be shared by Vermilion County.

TOPEKA, KAN.—The Leavenworth, Topeka & Southwestern, it is stated, will build three trestles.

TYRONE, PA.—The Commissioners of Blair county will build a new bridge over the Juniata River in Tyrone. W. S. Hostler, County Clerk, Hollidayburg.

WINDSOR, ONT.—The Midland, of Nova Scotia, will build a bridge across the Subenacadie River. (See Railroad Construction column.)

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Chicago & Alton.—Preferred and common, quarterly 1¾ per cent., payable June 1.

Wilmington & Weldon.—Four per cent., payable May 10.

Nashua & Lowell.—Five per cent., payable May 2.

Metropolitan Street (Kansas City).—Quarterly, ½ per cent., payable May 1.

West Chicago Street.—Quarterly, 1½ per cent., payable May 16.

Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:

American Society of Civil Engineers.—Meets at the house of the society, 220 West Fifty-seventh street, New York, on the first and third Wednesdays in each month at 8 p. m.

Association of Engineers of Virginia.—Holds its formal meetings on the third Wednesday of each month from September to May, inclusive, at 710 Terry Building, Roanoke, at 5 p. m.

Boston Society of Civil Engineers.—Meets at 715 Tremont Temple, Boston, on the third Wednesday in each month at 7.30 p. m.

Canadian Society of Civil Engineers.—Meets at its rooms, 112 Mansfield street, Montreal, P. Q., every alternate Thursday at 8 p. m.

Central Railway Club.—Meets at the Hotel Iroquois, Buffalo, N. Y., on the second Friday of January, March, May, September and November, at 2 p. m.

Chicago Electrical Association.—Meets at Room 7,137, Monadnock Building, Chicago, on the first and third Fridays of each month at 8 p. m. J. R. Cravath, secretary.

Civil Engineers' Club of Cleveland.—Meets in the Case Library Building, Cleveland, O., on the second Tuesday in each month at 8 p. m. Semi-monthly meetings are held on the fourth Tuesday of each month.

Civil Engineers' Society of St. Paul.—Meets on the first Monday of each month except June, July, August and September.

Denver Society of Civil Engineers.—Meets at 3 Jacobson Block, Denver, Col., on the second Tuesday of each month except during July and August.

Engineers' Club of Cincinnati.—Meets at the rooms of the Literary Club, 25 East Eighth street, on the third Thursday of each month, excepting July and August, at 7.30 p. m.

Engineers' Club of Columbus (O.).—Meets at 12½ North High street on the first and third Saturdays from September to June.

Engineers' Club of Minneapolis.—Meets in the Public Library Building, Minneapolis, Minn., on the first Thursday in each month.

Engineers' Club of Philadelphia.—Meets at the house of the club, 1122 Girard street, Philadelphia, on the first and third Saturdays of each month at 8 p. m., except during July and August.

Engineers' Club of St. Louis.—Meets in the Missouri Historical Society Building, corner Sixteenth street and Lucas place, St. Louis, on the first and third Wednesdays in each month.

Engineers' Society of Western New York.—Holds regular meetings on the first Monday in each month, except in the months of July and August, at the Buffalo Library Building.

Engineers' Society of Western Pennsylvania.—Meets at 410 Penn avenue, Pittsburg, Pa., on the third Tuesday in each month at 7.30 p. m.

Locomotive Foreman's Club.—Meets every second Tuesday in the clubroom of the Correspondence School of Locomotive Engineers and Firemen, 335 Dearborn street, Chicago.

Master Car Builders' Association.—Saratoga Springs, N. Y., Wednesday, June 15.

Master Mechanics' Association.—Saratoga Springs, N. Y., Monday, June 20.

Montana Society of Civil Engineers.—Meets at Helena, Mont., on the third Saturday in each month at 7.30 p. m.

National Association of Car Service Managers.—This Association will hold its annual meeting at Columbus, O., May 17.

New England Railroad Club.—Meets at Pierce Hall, Copley Square, Boston, Mass., on the second Tuesday of each month.

New York Railroad Club.—Meets at 12 West Thirty-first street, New York City, on the third Thursday in each month at 8 p. m.

Northwest Railway Club.—Meets on the first Tuesday after the second Monday in each month at 8 p. m., the place of meeting alternating between the West Hotel, Minneapolis, and the Ryan Hotel, St. Paul.

Northwestern Track and Bridge Association.—Meets at the St. Paul Union Station on the Friday following the second Wednesday of March, June, September and December, at 2.30 p. m.

Railway Club Secretaries.—Congress Hall, Saratoga, N. Y., June 8, 11 o'clock a. m. H. H. Roberts (St. Louis Railway Club), Secretary.

St. Louis Railway Club.—Holds its regular meeting on the second Friday of each month at 3 p. m.

Southern and Southwestern Railway Club.—Meets at the Kimball House, Atlanta, Ga., on the second Thursday in January, April, August and November.

Technical Society of the Pacific Coast.—Meets at its rooms in the Academy of Sciences Building, 819 Market street, San Francisco, Cal., on the first Friday in each month at 8 p. m.

Western Foundrymen's Association.—Meets in the Great Northern Hotel, Chicago, on the third Wednesday of each month. A. Sorge, Jr., 1533 Marquette Building, Chicago, is secretary.

Western Railway Club.—Meets in Chicago on the Third Tuesday of each month at 2 p. m.

Western Society of Engineers.—Meets in its rooms on the first Wednesday of each month at 8 p. m., to hear reports and for the reading and discussion of papers. The headquarters of the society are at 1736-1739 Monadnock Block, Chicago.

The Railway Signaling Club.

A meeting of the Railway Signaling Club was held at the Great Northern Hotel, Chicago, at 3 o'clock, Tuesday afternoon, May 10. The question of adopting standards for the detail parts of signal apparatus was discussed at considerable length, but no definite action was taken and the subject was referred to a special committee. At 8 o'clock a Club Smoker was held at the Great Northern Hotel.

Western Society of Engineers.

The Western Society of Engineers held a meeting in the Society Rooms, Monadnock Block, Chicago, Wednesday evening, May 4. The papers on fire-proof construction of buildings presented at the previous meeting by Gen. William Sooy Smith and Mr. Frank B. Abbott were discussed. Mr. T. W. Snow, of the U. S. Wind Engine and Pump Co., read a paper entitled, "Locomotive Water Supply," which will be discussed at the next meeting, May 18, previous to which time the paper will be printed and sent to the members and others interested in the subject. At the next meeting two papers will be presented, one entitled, "Gaging of Streams," by Mr. William G. Price, and the other, "The Use of Coke Breeze in Sewage Purification," by Mr. John W. Alvord.

Freight Claim Agents' Asociation.

The annual meeting of the Freight Claim Agents' Association of America was held at Denver, Col., on May 4 and 5. About 100 members were present. The total membership is now 276. The Committee on Constitution recommended that hereafter only one meeting be held each year, instead of two, but the recommendation was not accepted. Discussions were had on reports by the Loss and Damage Committee, the Committee on Overcharge Rules and the committees on Uniform Blanks and on Car Seals.

W. H. Hancock (U. P.) was elected President, J. F. Orndorf (C. & O.) Vice-President, and W. P. Taylor (R., F. & P.), Richmond, Va., Secretary. The next meeting will be held at Mobile, Ala., in October.

A number of the members in attendance were accompanied by their wives, and after the meeting excursions were made to Colorado Springs, Pike's Peak and other places.

Engineers' Club of St. Louis.

The four hundred and seventy-second meeting was held May 4 at 8 p. m., with President Bryan in the chair. Twenty-two members and seven visitors were present.

The President stated that he had received an invitation from the Society of Civil Engineers of France to send delegates to its fiftieth anniversary celebration in Paris in June.

The paper by Mr. Thomas D. Miller on "The Recently Discovered Oil Field of Texas" was read by the Secretary. A description of the oil district of Corsicana, analyses of the oil and statistics regarding the output were given. A sample of the oil and drawings were submitted.

Prof. J. H. Kenealy gave a talk on the ventilation of school buildings. He illustrated his remarks by showing a number of lantern slides. The discussion on ventilation was participated in by Messrs. Bryan, Ittner and Ferguson.

Western Foundrymen's Association.

A regular meeting of the Western Foundrymen's Association was held Wednesday evening, April 20, at the Great Northern Hotel, Chicago. A topical discussion was held, the first topic considered being the advisability of artificial ventilation for foundries, and the second the effect upon coke of exposing it freely out-of-doors. The sense of the meeting seemed to be that where foundries were so surrounded by buildings or other obstructions that the natural ventilation was interfered with artificial ventilation by fans was desirable. Some difference of opinion developed during the discussion of the second question, some holding that coke, when freely exposed, would soften and thus deteriorate, while others claimed that the sulphur in the coke, upon exposure, is brought to the surface and the effect of rain was to dissolve a considerable portion of the sulphur and so improve the coke for foundry purposes.

The annual meeting will be held Wednesday evening, May 18, at the Great Northern Hotel. At this meeting the officers for the ensuing year will be elected.

American Society of Mechanical Engineers.

The spring meeting of the Society will be held at the Cataract House, Niagara Falls, May 31 to June 3. The first session will open on Tuesday evening, May 31, with an address by Hon. Arthur Hastings, Mayor of Niagara Falls, followed by an illustrated description of the work and methods of the Cataract Construction Co., by Messrs. Coleman Sellers and W. A. Brackenridge. On Wednesday morning the following papers will be taken up: "Plea for a Standard Method of Conducting Engine Tests," by George H. Barrus; "Extension of the Standard Uniform Methods of Conducting and Reporting Steam Engine Tests," by Bryan Donkin; "The Hanging and Setting of Fire-Tube Boilers," by O. C. Woolson; "What Is the Heating Surface of a Steam Boiler?" by C. W. Baker. On Wednesday afternoon the usual excursions, which are a special feature of the spring meetings, will take place, and on Wednesday evening a social reunion or reception will be held in the parlors of the International Hotel. On Thursday morning the following papers will be taken up: "Patents," by James W. See; "Relations Between the Purchaser, the Engineer and the Manufacturer," by W. H. Bryan; "One Hundred Years of Ginning and Baling Cotton," by George A. Lowry; "Graphic Diagrams and Glyptic Models," by R. H. Thurston; "The Protection of Steam Heated Surfaces," by Charles L. Norton. Thursday afternoon and evening the members will take an excursion through the Gorge, going as far as Queenstown, where they will cross to Lewiston and return by the Gorge. The closing session will be held Friday morning, at which time the following papers will be read: "Bending Tests of Locomotive Staybolts," by F. J. Cole; "Note on the Carbon Contents of Piston Rods," by J. E. Johnson; "Experiments on Cast Iron Cylinders," by C. H. Benjamin; "Mechanical Properties of Certain Aluminum Alloys," by R. C. Carpenter; "Method of Manufacture and Tests of a New Seamless Tube," by R. C. Carpenter and P. J. Fickinger.

PERSONAL.

—Chief Engineer C. H. Loring, U. S. N. (retired), has been appointed inspector of machinery at the Quintard Iron Works.

—Passed Assistant Engineer J. C. Kafer, U. S. N. (retired) has been appointed assistant inspector of machinery at the Morgan Iron Works.

—Mr. C. T. Sivalls, of Chicago, Ill., Traffic Manager for Sells Brothers & Forepaugh's shows, has retired after a service of nearly 40 years, and has taken up his residence in Houston, Tex.

—Lieut. Colonel William Ludlow, Corps of Engineers, U. S. A., has been nominated by the President to be Brigadier General of Volunteers. Colonel Ludlow is now serving on the staff of General Miles as Chief of Engineers.

—Mr. Merritt Clark died at Poultney, Vt., May 5, at the age of 95. He was born in Middletown, Vt., Feb. 11, 1803. He was Cashier of the Bank of Poultney for 40 years. Mr. Clark was the projector of the Rutland & Washington Railroad, which was sold to the Rensselaer & Saratoga in 1868, and was President of the Rutland & Washington for seven years up to that date.

—Mr. A. J. Whitehead, Traveling Passenger Agent of the Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at Dallas, Tex., died Monday, May 2, of Bright's disease, at the age of 47 years. Mr. Whitehead entered railroad service with the Cairo & Vincennes, and when that road was consolidated with the C., C., C. & St. L., in 1890, he became District Passenger Agent at Cairo, Ill.

—Mr. R. H. Garratt, formerly Assistant General Passenger Agent of the New Orleans & Northeastern until December, 1897, when his title was changed to Ticket Agent at New Orleans, La., died at his home in that city May 1, from a stroke of apoplexy. (Dec. 24, 1897, p. 917.) Mr. Garratt began railroad work with the Vicksburg & Meridian, now known as the Alabama & Vicksburg, a part of the Queen & Crescent system.

—Mr. Addison Hills, Assistant to the President of the Lake Shore & Michigan Southern, died of pneumonia at his home in Cleveland, O., May 7, at the age of 91. Mr. Hills had been in railroad service since 1837. In 1881 he was Assistant General Manager of the L. S. & M. S., and was appointed Assistant to the President of that road in December, 1886, and held this position until May 3, this year, resigning on account of illness.

—Mr. Thomas B. Twombly, formerly Master Mechanic of the Chicago, Rock Island & Pacific at Chicago, has been adjudged insane and a conservator has been appointed for his estate. Mr. Twombly is 74 years of age and had been in railroad service since Mar. 12, 1849, having entered with the Connecticut River Railroad (B. & M.), in that year. He was appointed Master Mechanic of the C., R. I. & P. in 1867 and retired in 1890.

—Mr. A. G. Wand has been appointed General Agent for North America of the London & North Western Railway, Caledonian Railway and Great Southern & Western Railway (Ireland), to succeed Mr. C. A. Barattoni, deceased. Mr. Wand has been in the service of the London & North Western nearly 25 years, and was transferred to New York from the London office of the company when the late agent was appointed in 1887.

—Mr. Arthur L. Mills, who recently resigned as Superintendent of the Toledo, St. Louis & Kansas City, has become a member of the grain firm of Paddock, Hodge & Co. of Toledo, O. Mr. Mills had been in railroad service for 19 years, having started as Assistant Engineer on the Atchison, Topeka & Santa Fe. He was Principal Assistant Engineer of the T., St. L. & K. C. until May 22, 1893, on which date he was appointed General Superintendent. (Apr. 15, p. 284; Apr. 29, p. 300.)

—Mr. Charles H. Phinizy, President of the Georgia Railroad & Banking Company from 1879 until Nov. 9, 1897, died at his home in Augusta, Ga., April 28, at the age of 63. Mr. Phinizy was born in Richmond County, Georgia, Jan. 16, 1835, and commenced service with the Blue Ridge Railroad of South Carolina in 1855 as Assistant Civil Engineer. In 1888 he became President of the Atlanta & West Point, and remained as President until 1894. He was also President of the Western Railway of Alabama from Oct. 27, 1889, to Sept. 5, 1894.

—Mr. Thomas H. McLeon, who was recently elected President and General Manager of the Toledo Traction Co., has just entered on his new duties. He was General Manager of one of the companies that merged into the Metropolitan Traction Co. of New York for over 16 years, and held a similar position with the Citizens' Street Railway Co. of Indianapolis, where he remained for two and a half years. He then accepted the position of President and General Manager of the Ferrocarriles del Destrito Federal de Mexico, which company operates the street railroads of the City of Mexico. In all these positions he has been very successful, instituting new methods, which have resulted in betterments to the lines.

—Brevet Major-General Robert F. Stockton died at his home in Trenton, N. J., May 5, after an illness of about a week. Gen. Stockton was born in Princeton, N. J., Jan. 22, 1832. He graduated from Princeton in 1851, and was admitted to the bar in 1854. Jan. 30, 1858, he was made Brigadier-General and became Adjutant-General of New Jersey, which office he held during the Civil War. He was breveted Major-General in 1859. Gen. Stockton was made President of the Delaware & Raritan Canal Co. in 1866, and held office until 1872, when the canal company was merged into the United New Jersey Railroad & Canal Co. (P. R. R.), of which he became a director and was President of at the time of his death. General Stockton was also one of the incorporators of the Camden & Amboy.

—Mr. John M. Toucey, for the last eight years General Manager of the New York Central & Hudson River Railroad, and for the last few weeks Assistant to the President, has been put on the retired list of that organization with half pay. We judge, in fact, that he is the retired list, as we know of no other officer having that distinction. Mr. Toucey's friends are not at all surprised at this. For some months he has been close to the point of resigning, and has only been restrained by the solicitation of various friends. Mr. Toucey is within two or three months of 70 years of age. He went to work as a railroad man when he was still a boy, and in all the years that have elapsed he has had almost no vacation. He has ample means, he has still sufficient physical vigor to enjoy life, his intellectual faculties are as strong as ever, and nothing would be more natural than that he should choose the time of his seventieth birthday to retire for a few years of rest without official responsibility or business care. The only wonder is that he has not retired before. The recent change in the operating organization of the company gave him the opportunity, perhaps the impulse, which directly led to the step which he had for some time contemplated.

Mr. Toucey was born in Newtown, Conn., in 1828. He began his railroad work as a station agent on the Naugatuck Railroad when he was 20 years old. In 1855 he went into the employ of the Hudson River Railroad Company, and held positions as conductor and as station agent, being for a part of the time at East Albany. His ability to adapt himself to any circumstances or emergency led to his appointment, in 1861, as Assistant Superintendent of the road. In 1867 he became General Superintendent, and continued in charge of the same section of road after the consolidation in 1869, the extension of his authority over the lines west of Albany not occurring until the retirement of Mr. James Tillinghast from their control in 1881. In 1890 Mr. Toucey became General Manager, that office having been created for him, and he remained General Manager until the office was abolished on the accession of Mr. Callaway last month to the Presidency, at which time Mr. Toucey was made Assistant to the President.

Mr. Toucey's career has been a part of the history of the New York Central & Hudson River Railroad. For 43 years he has been a responsible officer, and he had the confidence of Commodore Vanderbilt and of his son and grandsons since the beginning of the Commodore's control in 1864. He was one of the men selected by the unerring judgment of Vanderbilt to help in building up and administering his great properties, and neither the elder Vanderbilt nor those of the family who have followed him in the control and counsels of the company have had any occasion to doubt the wisdom which chose and trusted Mr. Toucey. His life has been an example of the best school of American railroading during the creative period. He brought to his work unwearying fidelity, a devotion which knew no limit either of time or strength or zeal, an inflexible resolution, a fearlessness in taking responsibility, and withal a keen and always fresh desire to learn that which was best in every man's practice. These were the characteristics of the breed of men who built up the railroads of the United States, and, indeed, who built up the Republic, and among these Mr. Toucey stands as a shining example.

ELECTIONS AND APPOINTMENTS.

Baltimore & Ohio.—Alex. Hollander & Co., corner Wall and Beaver streets, New York City, have been appointed Import Freight Agents, succeeding O. G. Hemstead & Co.

Bellingham Bay & British Columbia.—W. H. Lawson has been appointed Assistant Superintendent, with office at New Whatcom, Wash., succeeding A. Branin.

Brockville, Westport & Sault Ste. Marie.—At a meeting of the Directors, recently held in Brockville, Ont., James G. Leiper resigned as President and was succeeded by Evans R. Dick, of 310 Chestnut street, Philadelphia, Pa. Mr. Dick was also elected a Director of the company.

Camden County (P. & R.).—At the annual meeting, held in Philadelphia May 2, Joseph S. Harris was elected a Director. (May 6, p. 332.)

Canada Atlantic.—A. J. Pedon, formerly Auditor, has been appointed General Auditor, his headquarters remaining at Ottawa.

Charleston & Western Carolina.—George T. Bryan has been appointed General Agent at Atlanta, Ga., succeeding J. E. Crosland, Jr., resigned.

Chicago & Alton.—At a meeting of the Directors, held in Chicago May 4, Horace E. R. Wood, formerly Cashier, was elected Secretary and Treasurer, to succeed the late Charles H. Foster. (April 15, p. 284.)

Chicago & South Bend.—C. L. Millhouse has been appointed General Manager, with office in South Bend, Ind., succeeding C. W. Stover.

Chicago, Burlington & Quincy.—C. A. Samson has been appointed Assistant Auditor of the Burlington & Missouri River lines with office in Omaha, Neb., succeeding Edward O. Brandt, resigned. (Apr. 29, p. 316.)

Chicago, Peoria & St. Louis.—At the annual meeting held in Springfield, Ill., May 7, Ralph Blaisdell of St. Louis, Mo., was elected Secretary and Treasurer, succeeding Charles D. Moyer of Springfield.

Chicago, St. Paul, Minneapolis & Omaha.—L. F. Slaker has been appointed Superintendent of the Eastern Division, succeeding J. McCabe, transferred to other duties. (April 22, p. 299.)

Cincinnati, Portsmouth & Virginia.—Evans R. Dick has been elected Vice-President, with office in Philadelphia, Pa., succeeding James G. Leiper, resigned.

Cleveland, Cincinnati, Chicago & St. Louis.—W. F. Greaves has been appointed General Southern Freight Agent, with headquarters at Atlanta, Ga., succeeding the late J. M. Duncan. (April 29, p. 316.)

Dauphin & Berks (P. & R.).—At the annual meeting,

held in Philadelphia May 2, B. H. Bail was elected a Director, succeeding the late Thomas McKean.

East Tennessee & Western North Carolina.—J. E. Vance has been appointed Auditor, with headquarters at Cranberry, N. C., succeeding the late Wallace Hahn.

Elmira & Lake Ontario (P. & R.).—At the annual meeting of the stockholders, held in New York City May 5, the following Directors were elected for the ensuing year: Frank Thompson, J. N. Hutchinson, B. F. Newcomer, John T. Green, Charles E. Pugh, George M. Diven, Samuel Rea, N. P. Shortridge and M. H. Arnot.

Erie.—H. B. Chamberlain has been promoted from General Freight Agent of the Erie Division, with office in New York, to the position of Assistant General Freight Traffic Manager with office in New York. James Leeming, heretofore First Assistant General Freight Agent of the Erie Division, succeeds Mr. Chamberlain. Robert M. Parker, heretofore Second Assistant General Freight Agent of the Erie Division, has become Assistant General Freight Agent, and the offices of First and Second Assistant General Freight Agents have been abolished.

Flint & Pere Marquette.—W. B. Sears, formerly Chief Engineer, has had his title changed to that of Consulting Engineer, his headquarters remaining at Saginaw, Mich. G. M. Brown, heretofore Superintendent of Roadway and Structures, has been made Engineer in charge of bridges, culverts, buildings, interlocking, new construction and standards of maintenance, with office at Saginaw. E. Treadwell has been made General Roadmaster, in charge of maintenance of roadway, with office at Saginaw. H. E. Moeller, heretofore Assistant Passenger Agent, has been appointed General Passenger Agent. A. H. Hawgood has resigned his position as Superintendent of Steamships at Saginaw.

Grand Trunk Despatch.—Sumner Hopkins has been appointed Superintendent of this new fast freight line, with office in Brush Street Station, Detroit, Mich.

Hearne & Brazos Valley.—At the annual meeting held in Hearne, Tex., May 3, the following officers were elected: President, R. V. Whitehead, St. Louis, Mo.; Vice-President, L. W. Carr, Hearne, Tex.; Secretary and Treasurer, W. P. Ferguson, Hearne, Tex.; General Superintendent, Edwin Wilson, Austin, Tex.; General Freight and Passenger Agent, W. Kirlicks, Hearne, Tex.

Kansas City, Fort Scott & Memphis.—Assistant General Freight Agent J. D. Riddell, of Kansas City, Mo., has been appointed General Freight Agent, which office had been vacant for some time.

Kansas City, Pittsburgh & Gulf.—C. A. Peabody has been appointed Auditor and Treasurer of the Texarkana & Fort Smith, with headquarters at Texarkana, Tex., succeeding H. S. Wiggins.

J. C. Loverin, General Agent at Quincy, Ill., has been promoted Assistant General Freight Agent with office at Quincy.

Lake Shore & Michigan Southern.—At the annual meeting, held in Cleveland, O., May 4, Samuel R. Callaway and William H. Newman, the new President of the Lake Shore & Michigan Southern, were elected as Directors succeeding D. W. Caldwell and John De Koven, both deceased. (July 30, 1897, p. 546; May 6, p. 331.)

H. E. Felton, General Freight Agent, with office at Cleveland, O., has resigned and is now connected with the Standard Oil Co. Mr. Felton was formerly General Freight Agent of the Chicago & Eastern Illinois before taking service with the L. S. & M. S. in June, 1897.

Lehigh Valley.—A. W. Nonnemacher, heretofore Assistant General Passenger Agent, has been appointed Division Passenger Agent, with headquarters at South Bethlehem, Pa., the office of Assistant General Passenger Agent at Philadelphia being abolished when the general traffice offices were removed to New York. (May 6, p. 332.)

Little Kanawha Valley.—The recent changes among the officers are as follows: J. S. Withers has been made Vice-President; W. A. McCosh, Secretary and Treasurer; V. B. Archer, General Counsel, and C. L. Williams, formerly Treasurer, has been made Superintendent. Offices of all at Parkersburgh, W. Va.

Louisiana & Missouri River (C. & A.).—At the annual election held in St. Louis, Mo., May 4, George S. Tyler was elected Secretary, succeeding the late Charles H. Foster.

Maricopa & Phoenix & Salt River Valley.—B. F. Porter, recently appointed Acting Superintendent, has been appointed General Superintendent, with office at Phoenix, Ariz. (Jan. 28, p. 70.)

Merchants & Miners Transportation Co.—E. P. Whitney, formerly Traffic Manager, has been appointed to the office of Vice-President, which has been vacant for some time. D. H. Miller, Jr., has been elected Secretary, with office at Baltimore, Md., succeeding Charles A. Layfield.

Mexican Central.—At the annual meeting, held in Boston, Mass., the following new Directors were elected: Charles A. Brown, Richard Olney, Charles J. Paine, all of Boston, Mass., and Justino Fernandez, of Mexico. N. K. Black was recently appointed Soliciting Agent, with headquarters in the City of Mexico. H. R. Cornforth has resigned as Superintendent of the San Luis Division and was succeeded by E. E. Styner, May 6.

Midland of Nova Scotia.—The officers of this company, referred to in the Construction Column, are: President, W. O. Strachan, Montreal; Vice-President, S. H. Holmes, Halifax; Treasurer, W. Lyall, Montreal; Secretary, T. Watson, Montreal; Chief Engineer, Z. J. Fowler, Colchester, N. S. (April 29, p. 317.)

Missouri, Kansas & Texas Ry. of Texas.—C. A. Forrest has been elected Secretary, with office at Dallas, Tex., succeeding E. P. Frey.

Missouri, Kansas & Texas System.—The title of E. M. Collins has been changed from Car Service Agent to Superintendent of Car Service. His office remains at St. Louis, Mo.

New York, Chicago & St. Louis (L. S. & M. S.).—At the annual meeting, held in Cleveland, O., May 4, Charles F. Cox was elected a Director, succeeding his brother, the late Allyn Cox. (March 25, p. 223.) Walter B. Wright has been appointed Secretary to the President, succeeding Mills Bronson, who has been appointed Secretary to President Samuel R. Callaway, of the New York Central & Hudson River. (April 22, p. 299.)

Northern Pacific.—Walter Oakes, Superintendent of the Puget Sound & Alaska Steamship Company, which operates a line of steamers under the management of the Northern Pacific, has resigned. No successor will be appointed for the present.

Ohio River & Charleston.—At the annual meeting, held in Johnson City, Tenn., Thursday, May 5, the following new directors were elected: Evans R. Dick, J. Ogden Hoffman and Simon Davis, succeeding John J. Collier, John Goldthwaite and A. F. Freeman. Mr. Davis was elected Vice-President, succeeding Job H. Jackson.

Philadelphia & Reading Terminal (P. & R.).—At the annual meeting, held in Philadelphia May 2, H. A. DuPont was elected a Director, succeeding Francis Lynden Stetson. (May 6, p. 332.)

Philadelphia, Harrisburg & Pittsburgh (P. & R.).—At the annual meeting, held in Philadelphia May 2, C. E. Henderson was elected a Director, succeeding the late Thomas McKean.

Reading, Marietta & Hanover (P. & R.).—At the annual meeting, held in Philadelphia May 2, C. E. Henderson was elected a Director, succeeding the late Thomas McKean.

Roaring Creek & Charleston and Roaring Creek & Belington.—Henry C. Terry, formerly Vice-President and General Solicitor, has been elected President, succeeding S. P. Diller. E. P. Rease is General Superintendent, with office at Belington, W. Va. Thomas Fisher has been appointed General Manager, with office in Philadelphia, succeeding O. W. Womelsdorf.

Schuylkill & Lehigh (P. & R.).—At the annual meeting, held in Philadelphia May 2, C. E. Henderson was elected a Director, succeeding the late Thomas McKean.

Shelbyville & Bloomfield.—The officers of this company, formerly the Northern Division of the Cumberland & Ohio (April 1, p. 228), are as follows: President, Samuel L. Spencer, 80 Broadway, New York; Superintendent, George R. Loyall; Secretary, J. N. Mitchell; Chief Attorney, Alex. P. Humphrey, all with offices at Louisville, Ky.

Sierra Railway of California.—H. J. Crocker has been elected President, with office at San Francisco, Cal., succeeding Andre Poniatowski. (April 1, p. 245.)

Southern.—F. M. Edwards, Resident Engineer on the new extension from Leeds, Ala., has resigned, and has been succeeded by H. P. Savage, of Mobile, Ala. (April 29, p. 317.)

Tecumseh.—The new officers of this company are as follows: General Manager, J. W. Lewis; Traffic Manager, S. P. Larsch; General Agent, A. J. Floyd, with offices at Tecumseh, Ind. Ter.

Union Pacific.—J. H. Lothrop, General Agent of the Freight Department at Pittsburgh, Pa., has moved his headquarters to Cleveland, O.

Washington & Columbia River.—C. S. Mellen has been elected President, with office at St. Paul, Minn., and George H. Earl has been elected Secretary, with office in New York. (Feb. 25, p. 150; March 4, p. 169; March 11, p. 187.)

Wisconsin Central.—A. P. Gothlin has been appointed General Agent at Cincinnati, O., F. T. Erbert General Agent at Chicago, and W. T. Pratt General Agent at Pittsburgh, Pa.

RAILROAD CONSTRUCTION,
Incorporations, Surveys, Etc.

ATCHISON, TOPEKA & SANTA FE.—It is officially stated that the rails for 5 miles of track, recently secured by the Gulf, Colorado & Santa Fe line, are being used for new tracks in the yards at Galveston, Tex., where improvements are being made. (Apr. 29, p. 317.)

BANGOR & PORTLAND.—The branch of 1½ miles proposed in Northampton County, Pa., from Pen Argyl is officially stated to be the American Bangor quarries, above Delabole. The company expects to complete it within the next 60 days.

BOSTON & MAINE.—It is officially reported that there is no truth in the statement that preliminary surveys had been made for changing the grades about two miles below Plaistow, Mass., and Newtown Junction. (April 29, p. 317.)

CAPE FEAR & YADKIN VALLEY.—Devane & Hall of Maxton, N. C., are reported to be building a narrow gage branch to be used for hauling lumber from tracts in Richmond County.

CHICAGO, BURLINGTON & QUINCY.—Surveys are being made, according to report, for a branch from the main line at or near Alliance, Neb., southwest to Denver, Col.

William Carr & Son, of Tecumseh, Neb., have a contract from the Burlington & Missouri River lines for work on the changing of the roadbed about 3 miles along the Nemaha River. Work was commenced this week.

CHICAGO, ROCK ISLAND & PACIFIC.—Official denial is made of the report that this company is surveying for a line from Topeka, Kan., to Kansas City, Mo. The C., R. I. & P. has a long contract with the Union Pacific for trackage between these points, and has no desire to build a line of its own. (Apr. 29, p. 300.)

CHOCTAW, OKLAHOMA & GULF.—Grading is reported to be completed on the extension from Wister, I. T., east 6½ miles to a point on the Kansas City, Pittsburgh & Gulf. Heavy rains and floods have delayed the bridge over the Poteau River. (March 18, p. 208.)

DECATUR, DANVILLE & SOUTHWESTERN.—This company has been organized to build a line from Decatur, Ala., south about 18 miles to Danville, and ultimately to extend it to Jasper, about 40 miles additional, and perhaps to Tuscaloosa. Joseph Shackelford of Danville is one of the promoters.

ELGIN, JOLIET & EASTERN.—The Waukegan, Ill., City Council has passed an ordinance granting this company right of way to build a spur track to proposed harbor slip and docks, to be finished in 90 days. The Crouch Construction Co., of Chicago, has taken the contract.

ELKHART & WESTERN.—This company has filed a map of extension of its present terminus at Mishawka, Ind., west four miles to a connection with the Vandalia line at South Bend. This extension will complete the belt line around South Bend. The northern part of the belt was built about two years ago by the Indiana, Illinois & Iowa. This extension will be built immediately. H. E. Bucklen of Chicago is President and W. H. Rosencrans of South Bend, Chief Engineer. (Official.)

EVERETT & MONTE CRISTO.—The work of restoring this road is of a temporary nature, and is being done only to get out the rolling stock which was stranded by the washouts last fall. (April 15, p. 285.)

FALLSBURG & MONTICELLO.—A mortgage of $75,000 has been filed in New York City to the Continental Trust Co., of New York, to secure funds to build this line, which is to run from Monticello, N. Y., on the Port Jervis, Monticello & New York, north 6 miles to Fallsburg. Surveys are completed and work is to begin at once. Rails of 60-lb. weight have been bought sufficient for the 6 miles. B. Van Steenbergh is President, and C. W. Smith Chief Engineer, both at 53 Broadway, New York. (Official.)

MEXICAN CENTRAL.—The annual report of this company states that the greater part of the Tampico line in the low country will be rock ballasted in 1898 and heavier rails laid on road in the mountains. The Chihuahua Division having suffered severely from the rains in 1897, which were the heaviest known for years, the company has considered it advisable to relocate the tracks north of Chihuahua to higher level.

MEXICAN INDUSTRIAL.—This company is building a belt line around the City of Mexico to connect all the railroads entering that city. The belt line will be 9.5 km. long (5.9 miles), with a connecting line to San Nicholas, making a total length of about 28.5 km. (17.6 miles). S. W. Reynolds of Mexico City is President.

MIDLAND OF NOVA SCOTIA.—Location surveys are in progress for this line from Windsor, N. S., east 60 miles via Kennetcook River to Truro. The contract for building has been let to W. G. Reid of Montreal, who has sublet in part to Fitzpatrick Bros. The work is not difficult. There will be one bridge on the Subenacadie River, expected to cost between $60,000 and $100,000. Bids have been asked for equipment. The road is to be completed Sept. 9, and will furnish an air line from Sidney to Boston, and will pass through a fertile and populous country which should afford much local traffic. (Official.) The officers are given under Elections and Appointments.

MONROE RAILWAY & CONSTRUCTION CO.—Work was begun May 2 on this line from Monroe, Ia., southwest 89 miles via Winfield to Natchitoches. L. D. McLean, of Monroe, is President. (April 15, p. 285.)

NASHVILLE & KNOXVILLE.—Location surveys are in progress for the extension of this line from Monterey, Tenn., east 40 miles to Glen Mary. (April 1, p. 245.)

NASHVILLE, CHATTANOOGA & ST. LOUIS.—Official statement is made that a preliminary line has been run from a point 1½ miles south of Chickamauga Station to Chickamauga Park, Ga., about 6 miles, but the company has not yet determined to build the road. (May 6, p. 332.)

NEW ROADS.—Surveys are reported in progress for a line from Hagan, Ga., south 18.5 miles to Glennville. Perkins Bros. of Macon, Ga., will build it.

NEW YORK, WYOMING & WESTERN.—This company has applied for charters in Pennsylvania and New Jersey to build a line from Scranton, Pa., east to New York City. The road is said to be planned as a coal carrier. The officers and directors are as follows: President, E. B. Sturgis; Vice-President, L. A. Watres; Secretary, Thomas E. Jones; Treasurer, Thomas H. Watkins; additional directors, Joseph J. Jermyn, J. J. Williams, C. D. Simpson, John Jermyn, J. N. Rice, John N. Kemmerer, O. S. Johnson and William Connell, all of Scranton, and W. G. Payne of Kingston.

NORTHERN PACIFIC.—Grading is practically completed and about 18 miles of track laid on the Gaylord & Ruby Valley line extension of the Parrot Branch from Whitehall, Mont., south 22.6 miles to Twin Bridges. Ballasting is also in progress. There is one bridge of importance on the line at the crossing of the Jefferson River, where two Howe truss spans 150 ft. long each were provided. Cook & Woldson of Butte, Mont., have the contract. (Mar. 18, p. 208.)

The new branch in Manitoba (Apr. 29, p. 317) is projected from a point between Belmont and Hilton on the N. P. Brandon Branch west about 50 miles to a branch of the Canadian Pacific at or near Hartney. Survey is in progress and contracts for building will be let very soon. The work is of the ordinary prairie construction with the exception of a short section of heavy cutting in embankments across Lang's Valley. No bridges or other special structures of importance are required. Rails and rolling stock will be furnished by the N. P. (Official.)

OHIO RIVER & LAKE ERIE.—This company is considering the advisability of making an extension from Bergholz, O., southeast. (April 29, p. 317.) Surveys have been made from Bergholz via Springfield and Richmond to Steubenville, and from Bergholz via Amsterdam and Smithfield to Wheeling. Another survey has just been completed from Bergholz via Amsterdam and Jefferson to Jewett. There is no prospect that building will be done by any of these routes in war times, but it is probable that sooner or later the line will be extended south. (Official.)

OREGON SHORT LINE.—The people of Boise, Idaho, have been agitating for some time the question of changing the main line so as to run through their city. The O. S. L. now has a branch of 19 miles from Nampa east to Boise and the proposed plan calls for an extension of this branch to the main line near Orchard, about 30 miles east of Nampa, but this change is not likely to be made. (Official.)

PENNSYLVANIA.—The extension of the Montalto line of the Cumberland Valley for ¾ of a mile through the town of Waynesboro, Pa., is to be done by the company's forces. (May 6, p. 332.) It will connect with the track owned and operated by the Geiser Manufacturing Co. of that place. The work is very light. (Official.)

The work of double-tracking and putting down 100-lb. rails on the 59 miles of the Atlantic City Division, between Camden and Atlantic City, of the West Jersey & Seashore, has been completed.

QUAKERTOWN & EASTERN.—The Philadelphia & Reading has leased rolling stock to this company, and nine miles of the completed road, from Quakertown, Pa., northeast to Springtown, has been put in operation. (Jan. 21, p. 51.)

ST. LOUIS, PEORIA & NORTHERN.—Surveyors, according to report, are running a line for the extension from Peoria, Ill., north about 90 miles to Clinton, Ia. The road from Springfield north 63 miles to Peoria has just been completed. (May 6, p. 333.)

SOUTHERN PACIFIC.—Preliminary work is reported under way on the 55 mile gap along the Pacific Coast from Elwood, Cal., northwest to Surf. (Mar. 18, p. 209.)

Grading has been completed and most of the track laid from Chino, Cal., northwest 4.5 miles to Pomona. (Apr. 29, p. 317.) Grant Bros. of Los Angeles, Cal., have the contract for grading and John McCarthy of Oakland, Cal., for trestles. Track-laying is being done by the company's forces. The line is to form a part of the Southern Pacific of California. (Official.)

The S. P. has decided to extend the Thibodeaux Branch in Louisiana from Thibodeaux northwest about 15 miles to Napoleonville. The work is very light with practically no grades or curves. The line is parallel with Bayou Lafourche through the sugar plantations now tributary to the line by flat boat communication centering at Thibodeaux and Lafourche Crossing. (Official.)

SPOKANE FALLS & NORTHERN.—On account of the failure of the Canadian Parliament to grant the charter for the extension down the Kettle River from Greenwood City, B. C., to the international boundary line, D. C. Corbin is reported to have decided to build an extension in Washington north via Republican Camp, which will tap the Boundary Creek country. (April 22, p. 301.)

TENNESSEE & CUMBERLAND RIVER.—This line was open April 27 from Bear Spring, Tenn., south 14 miles to Tennessee Ridge, on the Memphis Branch of the Louisville & Nashville. (April 15, p. 285.)

TEXAS STATE.—This line has been completed from Rusk, Tex., west 11 miles toward Palestine. (Jan. 21, p. 51.) It is used as a timber road by the Rusk Penitentiary, and it is ultimately intended to extend to Palestine, about 30 miles. James P. Gibson, Assistant Superintendent of the Rusk Penitentiary, has charge of the work. (Official.)

WILMINGTON & NORTHERN.—The annual report of this company states that right of way has been bought for $500 to fill up two bridges across a mill race south of Northbrook, on the main line, and that work has been begun. The filling in will do away with 53 ft. of bridges. The filling of 92 ft. of the west trestle at Birdsboro has been completed.

YAZOO DELTA.—Contracts have been let for building an extension from Ruleville, Miss., north 20 miles to Tutwiler, to connect with the Yazoo & Mississippi Valley; also from Moorehead south 15.5 miles to the Washington County line. (Apr. 1, p. 246.) These are to be completed by Aug. 1. About 200 teams and 400 men are at work. The line now runs from Moorehead north 21 miles to Ruleville, and was completed last year. C. H. Pond, of Moorehead, is President. (Official.)

Electric Railroad Construction.

ALLENTOWN, PA.—The Allentown & Kutztown Traction Co. was recently organized to build an electric road 18 miles long. The officers are: President, H. J. Schmick; Secretary, George Misch, both of Philadelphia; Treasurer, Asa R. Speers, Mauch Chunk. This company will probably succeed to the franchise of the Allentown & Reading Electric Railway, which started to build from Allentown to Reading, and abandoned the work after 1¼ miles of track had been laid. (April 8, p. 266.)

KANSAS CITY, KAN.—The Kansas City Elevated Railway Co. has applied for an extension of franchise for 20 years for the West Side surface lines. The company will double track a number of streets and will build incline planes, one at the Seventh St. viaduct, and one at Riverview, to connect the surface and elevated lines. These roads are parts of the Metropolitan St. Ry. Co.'s system.

BUTTE, MONT.—The Silver Bow Railroad Co. has applied for franchises to build branch lines from the city to the principal mines. This is the company which is building from Butte to Walkerville. (Nov. 12, 1897.)

CANTON, O.—The Stark Electric Railroad Co. has made a proposition to the city for building an electric railroad, and an ordinance granting rights of way will probably be passed. This company plans to build a road from Alliance to Canton, about 18 miles. The city of Alliance has given a franchise. (Nov. 5, 1897; April 22, 1898; pp. 791, 301.)

DETROIT, MICH.—The Detroit, Ypsilanti & Ann Arbor Electric Railroad will be running to Ann Arbor by May 15. The road is now running from Detroit to Wayne, 17 miles, and from Ann Arbor to Ypsilanti, about 7 miles. (Nov. 12, 1897, p. 826; Feb. 11, April 1, 1898, pp. 111, 246.)

FREDERICK, MD.—The incorporators of the Frederick Thurmont & Northern Electric Railroad Co. organized by electing the following officers: President, Col. L. Victor Baughman; First Vice-President, Isaac S. Annan; Second Vice-President, Alexander Ramsburg; Secretary, Charles C. Waters; Treasurer, Dr. F. B. Smith; Counsel, W. H. Hinks. A permanent office will be opened in this city at once. The present plan is to build an electric railroad from Frederick to Thurmont, about 14 miles, but it is proposed to extend this later on to Gettysburg, and possibly make it a part of the projected electric line from Washington to Gettysburg. (May 6, p. 333.)

LOS ANGELES, CAL.—The application of A. B. Patton for a franchise for an electric railroad from Los Angeles to Whittier, nine miles, was granted May 3, 1898, by the Board of Supervisors of Los Angeles County. Mr. Patton is acting through attorney C. C. Wright, and claims to represent Eastern capital. He says that a company will be formed at once, and that building will be begun soon.

MONTPELIER, VT.—Press reports state that an electric railroad is projected from Montpelier to Warren, and that A. O. Humphrey and F. C. Kennedy are interested.

NEW HAVEN, CONN.—The New Haven Street Railway Co. has completed its extension from Centreville to Mount Carmel. The extension to East Haven and Cosey Beach is rapidly approaching completion, and cars will be running in about two weeks. (Feb. 4, p. 89.)

NEW YORK, N. Y.—The Eighth avenue cars of the Metropolitan Traction Co. commenced running by the conduit electric system May 7, from 155th street as far south as 59th street.

PUTNAM, CONN.—Press reports state that work will be begun at once on the Putnam & Thompson Street Ry. George T. Nichols, President, Putnam; Robert L. Warren, Secretary, 53 State street, Boston; Van Wyck Rossiter, Treasurer, 107 Liberty street, New York.

ST. LOUIS, MO.—At the recent meeting of the stockholders of the Missouri Railroad Co. the old Board of Directors was re-elected and the proposed consolidation of the Missouri Railroad and the Lindell Railway Co. was discussed. A bill to authorize the consolidation is now pending in the Municipal Assembly. The control of the Missouri was purchased in the interest of the Lindell Co. in April, 1897, but the road has been run independently. Both companies have ordinances now pending in the Municipal Assembly which, if passed, will authorize them to build 21 miles of additional single track. The Olive street cable road of the Missouri Co. will be extended and changed to a conduit electric.

STILLWATER, N. Y.—The Stillwater & Mechanicsville Street Railway Co. will build an extension from Mechanicsville to Waterford, and has increased its capital stock from $75,000 to $250,000.

WASHINGTON, D. C.—The Baltimore & Washington Transit Co. has made a mortgage for $500,000 to the Guardian Security, Trust & Deposit Co. of Baltimore. The Baltimore & Washington opened its road from Brightwood north to Sligo in September, 1897, and by a traffic agreement with the Brightwood Electric Railway runs cars into Washington by way of Seventh St., where transfers are given to city lines. The road will now be extended north to Sandy Spring, about 12 miles.

WILKESBARRE, PA.—The Wilkesbarre & Northern Railroad Co., now operating between Luzerne and Harvey's Lake as a steam road, has let a contract for the electrical equipment of the road. The work will cost about $50,000, and will be completed about June 15. This company has been operating from Luzerne to Wilkesbarre over the tracks of the Wilkesbarre & Wyoming Valley Traction Co.

GENERAL RAILROAD NEWS.

Railroad Earnings.

Showing the gross and net earnings for the periods ending at the dates named:

December 31:		1897.	1896.	Inc. or Dec.	
Michigan Central.					
12 months	Gross	$13,697,229	$13,821,614	D.	$124,375
12 "	Net	3,447,729	3,429,264	I.	18,465
New York, Chicago & St. Louis.					
12 months	Gross	$5,815,217	$5,587,766	I.	$227,451
12 "	Net	1,306,194	1,196,759	I.	109,435

March 31:		1898.	1897.	Inc. or Dec.	
Boston & Maine.					
3 months	Gross	$4,299,086	$4,236,775	I.	$60,311
3 "	Net	1,107,333	1,264,994	D.	157,661
9 "	Gross	14,955,029	14,652,017	I.	303,012
9 "	Net	4,571,778	4,504,564	I.	67,214
Chicago, Indianapolis & Louisville.					
1 month	Gross	$265,304	$230,070	I.	$35,234
1 "	Net	76,483	50,629	I.	25,854
9 months	Gross	2,489,489	2,113,864	I.	375,625
9 "	Net	712,757	592,376	I.	120,381
Delaware & Hudson System:					
Albany & Suspuehanna.					
3 months	Gross	$881,656	$848,131	I.	$33,525
3 "	Net	341,943	344,703	D.	2,760
Rensselaer & Saratoga.					
3 months	Gross	$181,396	$192,264	D.	$10,868
3 "	Net	38,934	49,174	D.	10,240
New York & Sanada.					
3 months	Gross	$508,302	$486,384	I.	$21,918
3 "	Net	125,053	130,615	D.	5,562
Fitchburg.					
1 month	Gross	$581,426	$532,203	I.	$49,223
9 months	Gross	5,622,511	5,297,600	I.	324,911
9 "	Net	1,854,197	1,779,750	I.	74,447
Flint & Pere Marquette.					
1 month	Gross	$271,765	$247,875	I.	$23,890
1 "	Net	74,843	59,889	I.	14,954
3 months	Gross	720,314	665,039	I.	55,275
3 "	Net	158,623	160,633	D.	2,010
Illinois Central.					
1 month	Gross	$2,277,769	$1,799,818	I.	$477,951
1 "	Net	758,737	552,606	I.	206,131
9 months	Gross	20,825,188	16,871,563	I.	3,953,625
9 "	Net	6,833,730	5,267,732	I.	1,565,998
Kansas City, Fort Scott & Memphis.					
1 month	Gross	$451,945	$421,198	I.	$30,747
1 "	Net	144,089	128,560	I.	15,529
9 months	Gross	3,923,266	3,515,746	I.	407,520
9 "	Net	1,229,442	1,140,653	I.	88,789
Mexican National.*					
1 month	Gross	$536,342	$560,166	D.	$23,824
1 "	Net	247,962	290,109	D.	42,147
12 months	Gross	1,532,544	1,498,730	I.	43,814
12 "	Net	706,835	732,224	D.	25,389

*Mexican currency.

March 31:		1898.	1897.	Inc. or Dec.	
Minneapolis, St. Paul & Sault Ste. Marie.					
1 month	Gross	$317,764	$270,075	I.	$47,689
1 "	Net	149,682	111,712	I.	37,970
9 months	Gross	3,140,666	2,692,483	I.	448,183
9 "	Net	1,435,678	1,092,951	I.	342,727
New York Central & Hudson River.					
3 months	Gross	$10,795,422	$10,133,425	I.	$661,997
3 "	Net	3,307,470	3,246,449	I.	61,021
9 "	Gross	35,097,696	33,071,888	I.	2,025,808
9 "	Net	11,487,090	10,690,826	I.	796,264
New York, Ontario & Western.					
3 months	Gross	$858,221	$818,829	I.	$49,392
3 "	Net	256,230	225,380	I.	30,850
Oregon Short Line.					
1 month	Gross	$506,694	$434,512	I.	$72,182
1 "	Net	218,576	147,249	I.	71,327
9 months	Gross	4,647,145	4,207,530	I.	439,615
9 "	Net	1,877,635	1,445,478	I.	432,157
Philadelphia, Wilmington & Baltimore.					
1 month	Gross	.....	.....	D.	$26,600
1 "	Net	.....	.....	D.	65,600
5 months	Gross	.....	.....	I.	245,700
5 "	Net	.....	.....	I.	43,800
Rio Grande Western.					
1 month	Gross	$254,493	$183,870	I.	$70,622
1 "	Net	102,785	52,925	I.	49,860
9 months	Gross	2,495,025	1,812,051	I.	682,974
9 "	Net	938,026	588,833	I.	349,193
Union Pacific.*					
1 month	Gross	$1,298,525	$1,130,211	I.	$168,314
1 "	Net	572,837	428,201	I.	144,636
3 months	Gross	3,669,513	3,118,052	I.	551,461
3 "	Net	1,553,485	1,081,828	I.	471,657

*See below under Union Pacific.

April 30:		1898.	1897.	Inc. or Dec.	
Chicago Great Western.					
1 month	Gross	$400,683	$370,646	I.	$30,037
10 months	Gross	4,467,485	3,903,699	I.	563,786
Great Northern.					
1 month	Gross	$1,721,438	$1,354,204	I.	$367,234
10 months	Gross	18,998,326	16,317,769	I.	2,680,557
New York Central & Hudson River.					
1 month	Gross	$3,806,706	$3,504,808	I.	$301,898

ADDISON & PENNSYLVANIA.—This road has been sold at Bath, N. Y., under foreclosure suit of Randolph Rodman, Trustee for the first mortgage bondholders, and the State Trust Co. for the second mortgage bondholders. It was bid in for $40,000 by George R. Sheldon, representing the bondholders. The property has not been in the hands of a receiver. The line extends from Addison, N. Y., to Gaines, Pa., 41 miles, with a branch of 4 miles to Gurnee, Pa. It has a lease of the New York & Northern Pennsylvania from Gaines to Galeton, Pa., 5 miles. (Mar. 25, p. 225.)

ARKANSAS, LOUISIANA & SOUTHERN.—This company has been incorporated as successor to the Minden, which runs from Minden, La., to Sibley, 5.25 miles.

BALTIMORE & OHIO.—The Receivers' report for March shows receipts of $2,929,037 from traffic, and other income of $224,765; operating expenses, $713,449, and other disbursements, $2,140,814.

BEECH CREEK (N. Y. C. & H. R. R. R.).—At the annual meeting, held at Philadelphia May 6, it was decided to merge the Cambria County line with this road. The Cambria County is practically an extension of the Beech Creek from Wigton Mines, Pa., to Spangler, 8 miles, and was completed in March of last year.

CAPE FEAR & YADKIN VALLEY.—Judge Goff, at the United States Circuit Court of Appeals at Richmond, Va., May 3, decided in favor of the Baltimore Committee that the road be sold as a whole and not by division. The sale was ordered in June, 1897, but has been postponed under appeal. A receiver was appointed Mar. 31, 1894. The line extends from Wilmington, N. C., to Mt. Airy, 248 miles, with several branches. The Seaboard Air Line has made a proposition to lease the road in perpetuity on the basis of 75 p. c. of the gross receipts, the equipment to be maintained in good condition. (Dec. 17, 1897, p. 899.)

CENTRAL VERMONT.—Under orders of the Court, the Receivers have sold at public auction $72,000 of 5 p. c. bonds of the Consolidated of Vermont; $200,000 first consolidated 4 p. c. bonds of the C. V., and $18,000 6 p. c. bonds of the Ogdensburg Transit. They were bought by the American Loan & Trust Co. at 80, 10 and 57 respectively. The American Loan & Trust Co. is Trustee of the consolidated mortgage of 1892, now being foreclosed. The bill has became a law confirming the transfer to the American Loan & Trust Co. of the C. V.'s interest as lessee in the New London Northern.

The Governor of Vermont has signed a bill which provides that no alien company shall be interested in the stock of any Vermont railroad hereafter organized under Vermont laws without leave of the Legislature, or shall own or acquire title thereof. The bill was passed to prevent the Grand Trunk from obtaining control of the C. V. (Apr. 15, p. 286.)

CHESAPEAKE & NASHVILLE.—The statement that this road has been sold to the Middle & East Tennessee Central (Apr. 1, p. 247) is incorrect. The C. & N. formerly belonged to the M. & E. T. C., and has recently been bought by other interests. It runs from Gallatin, Tenn., northeast to Scottsville, Ky., 35.87 miles, and was sold under foreclosure Sept. 27, 1892, to W. A. Weber, by whom it has been operated pending the reorganization of the company.

CHICAGO, BURLINGTON & QUINCY.—Holders of 4 p. c. Nebraska extension bonds dated May 2, 1897, are notified that $294,410 has been set apart for the purchase of the same at the lowest price, not to exceed 110 p. c., and accrued interest. Bids will be received at the office of the company in Boston until May 18.

CHICAGO, ROCK ISLAND & PACIFIC.—The New York Stock Exchange has listed $5,200,000 of the new 4 p. c. general mortgage 90-year gold bonds, making a total listed of $31,494,000. This is under the refunding plan agreed to Feb. 15. (Apr. 22, p. 301.)

CINCINNATI, NEW ORLEANS & TEXAS PACIFIC.—The Ohio Legislature has passed a bill permitting the people of Cincinnati to vote on a proposition to extend the lease of the Cincinnati Southern, now operated by the C. N. O. & T. P., under a lease expiring in 1906, and to authorize an issue of $2,500,000 in bonds to pay for improvements of terminals. The C. N. O. & T. P. (part of the Queen & Crescent route) leased the Cincinnati Southern Oct. 12, 1881. The Cincinnati Southern was built by the city of Cincinnati and runs from Cincinnati to Chattanooga, Tenn., 325.92 miles. On Mar. 19, 1893, the leasing company was placed in the hands of a receiver. (Jan. 18, 1897, p. 448.)

COLUMBUS & CINCINNATI MIDLAND.—Charles S. Hinchman, Chairman of the Bondholders' Committee, and George Stevenson, Secretary, give notice to bondholders of trust certificates that upon presentation of the same to the Guarantee Trust Co., coupons on the bonds due Jan. 1, 1897, will be paid. This line runs from Columbus, O., to Midland City, 69.8 miles, and was leased in January, 1890, to the Central Ohio, the lease afterward being assigned to the Baltimore & Ohio, which owns the common stock.

HOUSTON BELT & MAGNOLIA PARK.—Special Commissioner Frank Andrews sold this property at auction at Houston, Tex., May 3, to J. E. McAshan, the only bidder, for $5,000, which is only half the upset price. The road runs from Houston, Tex., to Brady, 4.07 miles, and has been operated under contract by the Galveston, La Porte & Houston, which went into the hands of a receiver Jan. 7, 1895. A receiver was appointed for the H. B. & M. P., May 22, 1893. (April 22, p. 301.)

LOUISVILLE, NEW ALBANY & CHICAGO (Chicago, Indianapolis & Louisville.)—The United States Supreme Court has granted a writ of certiorari in the case of the Louisville Trust Co. vs. the L., N. A. & C., growing out of the guaranty of the bonds of the Richmond, Nicholasville, Irvine & Beattyville. In the proceedings to foreclose the mortgages on the L., N. A. & C., the Louisville Trust Co. intervened as creditor and objected to the foreclosure. This objection, however, was overruled by the Court and the property sold, which is now in the possession of its successor, the C., I. & L. The Louisville Trust Co. appealed in the foreclosure proceedings to the United States Circuit Court of Appeals at Chicago, and that court in February last affirmed the decree of sale. Thereupon application was made to the United States Supreme Court for a writ of certiorari, on the ground that the Circuit Court of Appeals at Chicago had erred in its decision, and this application has been granted. If the claim of the Louisville Trust Co. is sustained, the foreclosure proceedings of the L., N. A. & C. would be wiped out.

MEXICAN SOUTHEASTERN.—Bankruptcy of this company was not declared in Mexico until Apr. 5. Chief Engineer Stuart has made a bill of sale in favor of creditors in San Geronimo, Tehuantepec and Coatzacoalcos. To prevent scattering of the assets under this bill of sale, Lic. Francisco Alfaro, representing American creditors, has obtained an order from the First Civil Court of Mexico City calling upon provincial judges to stop further proceedings. This road went into the hands of H. W. Leman, of Chicago, as Receiver, on Feb. 3, by order of the District Court of Santa Fe County, N. M. The line as projected is to extend from San Geronimo on the National Tehuantepec southeast along the Pacific Coast 264 miles to the border of Guatemala, with a branch of 131 miles from the main line at Tonala, northeast across the mountain to San Cristobal. Only about 31 miles was completed when the road went into the hands of the Receiver. (Apr. 15, p. 286.)

MONTEREY & MEXICAN GULF.—Lic. Joan Jose Chavarri, Acting First District Judge at Monterey, Mex., on Apr. 28, ruled that all the accounts and expenses presented by Interventor J. A. Robertson in the suit against the Belgian syndicate now operating the M. & M. G., are approved and all charges made by him allowed. Signor Pablo Mecedo was appointed judicial receiver of the accounts of the road. The property of this company was attached several months ago and Manuel Contrueras was appointed receiver. This action was due to the failure of the Belgian Society, which owns the road, to carry out certain financial agreements. The line extends from General Trevina to Tampico, Mex., 387 miles, and was built by Joseph A. Robertson and other American contractors. A number of Americans are among the creditors. The Supreme Court of the Republic of Mexico recently decided that the Belgian Syndicate, which bought the road after its bankruptcy, is under no obligations to deposit $4,000,000 as guaranty of the payment of the claims of its creditors. The Belgian Society took possession of the property Dec. 1, 1895. (Dec. 24, 1897, p. 919.)

NEW YORK, SUSQUEHANNA & WESTERN.—Holders of receipts for preferred and common stock are notified that J. P. Morgan & Co., New York, are prepared to issue voting trust certificates for the same on the basis announced in March by the Erie road of nine-tenths of one share of first preferred stock of Erie for one share of preferred stock of N. Y., S. & W., and one share of common of Erie for one share of common of N. Y., S. & W. (Apr. 22, p. 301.)

NORTHERN PACIFIC.—A circular addressed by J. M. Hannaford, General Traffic Manager, to agents announces that the N. P. has absorbed three important railroads, known as the Montana Union, the Washington & Columbia River and the Seattle & International. Notice has already been given in these columns of the absorption of the Washington & Columbia River (Feb. 25, p. 150) and of the Seattle & International (Feb. 18, p. 132). The Montana Union extends from Butte, Mont., to Garrison, 57.4 miles, and from Stewart, Mont., to Anaconda, 14.83 miles. It was organized June 12, 1886. Half the capital stock heretofore has been owned by the Union Pacific, and the rest by the N. P. It has a lease of the Montana Railway from Anaconda Mine to Walkerville, 2.81 miles and from Walkerville to High Ore, 1.36 miles.

OHIO SOUTHERN.—Judge Richie, at Lima, O., May 7, entered a decree of foreclosure and sale of this line. A notice of appeal was given by one of the second mortgage bondholders, and the bond fixed at $100,000. (May 6, p. 334.)

PECOS VALLEY & NORTHEASTERN.—This new company, successor to the Pecos Valley, took possession of the property at 12 o'clock, midnight, April 30, and work has been begun on the extension northeast to Amarillo. (April 29, p. 318.)

PHILADELPHIA, READING & NEW ENGLAND.—At a meeting of the reorganization committee May 2, the reorganization plan was declared in operation and the attorneys instructed to proceed with the foreclosure sale. On May 6 there had been deposited under the plan $5,795,000 first mortgage bonds out of $6,250,000, and $2,927,000 series A and B bonds out of $3,850,000. (Apr. 22, p. 302.)

SHELTON SOUTHWESTERN.—The new company, to be known as the Shelton Southwestern Railway (instead of Railroad), has been incorporated and took possession of the property May 1. The line extends from Shelton, Wash., southwest 12 miles toward Gray's Harbor. A receiver was appointed Apr. 4, 1894. The property was sold to a local syndicate. (Apr. 30, 1897, p. 318.)

SHEPAUG, LITCHFIELD & NORTHERN.—A special meeting of the stockholders is to be held June 3 to approve a lease of this line to the New York, New Haven & Hartford for a term of 75 years from July 1. The N. Y., N. H. & H. owns $577,600 stock of this road, part of which was acquired in 1892 at the time control was obtained of the Housatonic. The S., L. & N. runs from Hawleyville, Conn., on the N. Y., N. H. & H., to Litchfield, 32.28 miles.

SIOUX CITY, O'NEILL & WESTERN.—There is litigation over the ownership of the bonds of this company. The case was submitted to the Supreme Court of the United States two weeks ago, and upon that decision will follow the reorganization of the company. This line runs from Covington, Neb., to O'Neill, 129.16 miles. It was chartered in 1891 as successor to the Pacific Short Line. A receiver was appointed Nov. 1, 1893, and the foreclosure sale was ordered in Jan., 1895.

SOUTHERN.—The earnings of the Memphis Division of the Southern, formerly the Memphis & Charleston R. R. (March 4, p. 171), for the month of March and the nine months ending March 31, which are not included in the earnings of the Southern, are as follows:

March:	1898.	1897.	Inc. or Dec.	
Gross earn.....	$118,094	$114,026	I.	$4,068
Oper. expen.....	84,683	85,526	D.	843
Net earn.....	$33,411	$28,500	I.	$4,911
Nine months:				
Gross earn.....	$1,215,955	$1,046,102	I.	$169,853
Oper. expen.....	858,895	761,730	I.	97,165
Net earn.....	$357,060	$284,372	I.	$72,688

SOUTHWESTERN ARKANSAS & INDIAN TERRITORY.—H. S. Dukes, Special Master, on May 4 filed with the Clerk of the United States Circuit Court at Little Rock, Ark., a supplementary report in the case of the Mound City Boot & Shoe Co. vs. the S. W. A. & I. T. and the Smithton Lumber Co., in which it was shown that the total indebtedness of the railroad is $55,841, of which $42,795 is statutory liens, mortgages, judgments and preferred claims, and the balance unsecured and unpreferred claims. This line extends from Smithton, Ark., to Pike City, 34.39 miles. Its capital stock is $1,400,000. A Receiver was appointed Mar. 9, 1896.

SUNBURY, HAZLETON & WILKESBARRE (W. R. R.).—The Fidelity Insurance, Trust and Safe Deposit Co., of Philadelphia, mortgage trustees, gives notice that 33 bonds, Series A, aggregating $12,700, have been drawn for payment at their office June 1 at par, with accrued interest.

TEXAS WESTERN.—According to newspaper report this road is to be sold to a new association of north Texas and Pennsylvania people, and the line is to be restored and extended. The T. W. was opened in 1878 from Houston, Tex., to Sealey, 53 miles. Under the original plan it was to be run to Presidio del Norte, 600 miles. It went into the hands of a receiver in October, 1886, and was bought by Elijah Smith of New York City, who operated it until it was again sold under foreclosure on Aug. 6, 1895.

TOLEDO, ST. LOUIS & KANSAS CITY.—The intervening creditors have given notice of an appeal from the foreclosure decree recently made against this road by United States Circuit Court Judge William H. Taft, of Toledo, O. The matter comes up on May 14 for determining the amount of bonds to be furnished. (Apr. 8, p. 267.)

UNION PACIFIC.—Circuit Judge Walter H. Sanborn for the District of Nebraska has issued an order that all persons having claims upon the funds of the U. P. held by William D. Cornish, Special Master at Omaha, must present them prior to May 25. Suits must be filed before June 1. (May 6, p. 324.)

Only the main line from Council Bluffs to Ogden was operated by the new Company during March, but for the purpose of comparison the Kansas and Denver Pacific lines operated by the Receivers are also included in the statement of earnings shown above. Earnings of all branch lines, and miscellaneous earnings are excluded.

UNION PACIFIC, CENTRAL BRANCH.—Hiram P. Dillon, Special Master, advertises the sale of the Atchison & Pike's Peak, now known as the Central Branch of the Union Pacific, to take place at Atchison, Kan., May 23. The upset price is $500,000, and each bidder must deposit $50,000 certified check. This line extends from Atchison, Kan., west 100 miles to Waterville, and is leased to the Missouri Pacific. It was organized Feb. 11, 1859, as the Atchison & Pike's Peak, and changed to its present name Jan. 1, 1867. It received from the Government 187,608 acres of land and bond at the rate of $16,000 per mile. The U. P. owns $874,200 of the $1,000,000 capital stock. Special Master Dillon will also sell the leased lines of this company, which are the Atchison, Jewell County & Western and the Atchison, Colorado & Pacific. The A., J. C. & W., which runs from Jamestown, Kan., to Burr Oak, 33.4 miles, is to be sold May 24 at Mankato, Kan., the upset price being $50,000, with deposits of $5,000 from each bidder. The A., C. & P. runs from Waterville, Kan., to Leonora, 193.39 miles, with branches from Greenleaf to Washington, 7 miles; Yuma to Warwick, 30.4 miles, and Downs to Alton, 23.6 miles, making a total of 254.79 miles. It is to be sold at Concordia, Kan., May 23, the upset price being $250,000, with $10,000 deposit from each bidder. These three lines went into the hands of the receiver with the U. P. Oct. 13, 1893.

Electric Railroad News.

NEW YORK, N. Y.—The second Ave. Railroad Co. has made a mortgage for $7,500,000 to secure 5 per cent. gold bonds due Feb. 1, 1948. Of the issue $1,960,000 is reserved to retire the following: First mortgage bonds of 1845, $1,600,000; debenture bonds of 1889, $300,000; real estate bonds, $60,000. The remainder of the loan will be issued from time to time, as may be found necessary. A certificate of the lease of the Second Ave. to the Metropolitan Street Railway Co. was filed at Albany, March 19.

The earnings of the Metropolitan Street Railway Co. for three months and for nine months ending March 31 are reported as follows:

Three months:	1898.	1897.
Gross earnings	2,423,255	2,092,462
Net earnings	1,088,302	952,057
Other income	147,950	117,990
Interest, taxes, etc.	812,293	784,060
Balance surplus	423,958	285,987
Nine months:	1897-98.	1896-97.
Gross earnings	7,024,655	6,502,327
Net earnings	3,266,581	2,951,644
Other income	463,254	328,162
Interest, taxes, etc.	2,385,102	2,362,834
Balance surplus	1,344,733	970,972

PITTSBURGH, PA.—Plans are under way for merging the Homestead & Highland Street Railway Co. with the McKeesport, Duquesne & Wilmerding St. Ry. Co. It is stated that Messrs. T. Mellon & Sons, of Pittsburgh, are promoting the matter.

TRAFFIC.

Traffic Notes.

The Wabash is to put on a new fast train between St. Louis and Buffalo, making connections through to Boston in 31 hours. The train will be called the Continental Limited and will be made up of cars with wide vestibules.

Shipments of 27 carloads of provisions for the army were made from Chicago for Southern points last week. The freight was distributed among three or four different lines in order to insure the quickest possible time.

The opening of the passenger service of the Providence Line steamers between Providence and New York has been indefinitely postponed in consequence of the war restrictions on the navigation of Narragansett Bay after sundown. For the same reason the Fall River steamers have had to change their time, and the steamboat train now leaves Boston at 4 o'clock instead of 6.

The jobbing merchants in a number of cities in Texas have for some time been complaining to the State Railroad Commissioners that freight rates from St. Louis on less than carloads were so low, as compared with carload rates, that the St. Louis wholesale mercnants secured more than their share of the business, and the Commissioners recently appointed a hearing with a view, apparently, of satisfying the complaint by ordering reductions from Texas distributing points. It is stated, however, in a press dispatch that a compromise has been reached which will preclude the necessity of a hearing.

Chicago Traffic Matters.

Chicago, May 11, 1898.

Still another Western freight association threatens to bite the dust, it being this time the Southwestern Traffic Association which is in danger of callapse, owing to the bad conditions of Texas rates. Its executive officers are making the usual attempt to effect a reorganization. During the past four months this agreement has been utterly disregarded.

Western lines are now cutting rates on packing house products, dressed beef and live stock from points in Iowa, Minnesota and Nebraska. The Burlington has made a rate of 15 cents, cut of 8½ cents, from all points on its lines in Nebraska and Iowa to Chicago.

Eastbound rates continue to be badly cut, and the cutting is pretty generally distributed over all commodities.

California passenger rates have become seriously demoralized, in consequence of the war with the Canadian Pacific.

The controversy over rates for the Utah teachers has been settled by granting a rate in the Western passenger territory of one fare for the round trip.

The Railroad Commissioners of this state have under consideration the reduction of live stock rates, shippers claiming that they are proportionately higher to Chicago than to St. Louis and other Western points.

Eastbound shipments, exclusive of live stock, from Chicago and Chicago junctions to points at and beyond the western terminus of the Trunk lines for the week ending May 5 amounted to 131,746 tons, as compared with 108,957 tons the preceding week. This statement includes 56,174 tons of grain, 7,468 tons of flour and 26,888 tons of provisions. The following table shows the quantities and proportions carried by the respective roads:

	Week Ending May 6.		Week Ending April 28.	
Roads.	Tons.	P. C.	Tons.	P. C.
Baltimore & Ohio.....	14,757	11.2	18,599	17.1
C., C., C. & St. L.....	13,492	10.2	6,378	5.9
Erie	18,331	13.9	15,690	14.4
Grand Trunk	4,890	3.7	5,329	4.9
L. S. & M. S.....	17,358	13.2	12,930	11.9
Michigan Central	15,754	12.0	13,623	12.5
N. Y., C. & St. L.....	9,718	7.4	6,675	6.1
Pitts., C., C. & St. L.....	8,954	6.8	6,993	6.4
Pitts., Ft. Wawne & Chi.	18,455	14.0	14,609	13.4
Wabash	10,455	7.6	8,140	7.4
Totals	131,746	100.0	108,967	100.0

Lake shipments last week were 168,429 tons.